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SELF-CONTROL AND DELINQUENCY:
AN EMPIRICAL TEST OF GOTTFREDSON AND HIRSCHI'S GENERAL THEORY OF CRIME

BY

TERESA C. LAGRANGE ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY.

DEPARTMENT OF SOCIOLOGY

Edmonton, Alberta

FALL 1996

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ISBN 0-612-18061-1

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DEGREE: Doctor of Philosophy

YEAR THIS DEGREE GRANTED: 1996

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled SELF-CONTROL AND DELINQUENCY: AN EMPIRICAL TEST OF GOTTFREDSON AND HIRSCHI'S GENERAL THEORY OF CRIME submitted by TERESA C. LAGRANGE in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY.

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ABSTRACT

This research uses data from the University of Alberta Study of Juvenile and Adolescent Behaviour (1994), a self-report survey of over 2000 Canadian teens, to evaluate the relationship between low self-control and delinquency as proposed by Gottfredson and Hirschi's General Theory of Crime (1990). Multiple indicators of both low self-control and opportunity are used to test the direct effects of these constructs and their interactions in predicting delinquency. Relationships are examined for the total sample, for younger versus older teens, and for females versus males. In addition, the relative importance of low self-control and opportunity in predicting three different sub-types of delinquency is evaluated. Results are strongly supportive of General Theory, identifying robust relationships between measures of low self-control and delinquency. At the same time, the role of opportunity is found to be highly complex, with the relative importance of interaction terms varying for different types of offending and for different groups of teens. Inclination alone, in the form of low self-control, is identified as the most important factor in predicting general delinquency and property crimes, and particularly for older teens and males. For younger teens and females, delinquency is found to be more dependent on low self-control's interaction with opportunity. A similar pattern is found for drug offences and violence. The significance of these findings for General Theory is discussed, and implications for future research are suggested.

ACKNOWLEDGMENTS

The research contained in this dissertation was supported, both directly and indirectly, by a number of agencies and individuals to whom I am indebted. Financial support was provided by the Social Sciences and Humanities Research Council of Canada through a doctoral fellowship and a research grant that funded the University of Alberta Juvenile and Adolescent Behaviour Study (1994). Assistance and cooperation in the gathering of data were freely provided by members of the Edmonton Public School Board and the principals and counsellors at the various schools involved in the study. Special thanks are due to those teachers who opened their classrooms for the administration of the survey. Finally, the study could not have been completed without the diligent efforts of graduate students at the University of Alberta, who invested their time and energy in administering the questionnaire and coding the data.

I am particularly grateful to a number of people who have supported and encouraged me in the writing of this dissertation. I am deeply indebted to my supervisor, Professor R. A. Silverman, for his generous and continual assistance in a variety of ways throughout my graduate career. Thanks are due to the members of my committee, for their helpful comments. Special thanks must go to my patient and long-suffering children, who have endured terrible meals and general inattention with surprising equanimity over a period of several months. And finally, this work would never have been completed without the endless support of my mother. Their substantial contributions notwithstanding, however, these individuals cannot be blamed for any errors or omissions in the following pages; these are entirely my own.

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CHAPTER 1

INTRODUCTION

Why do some people commit crimes? Attempting to answer this question is the central enterprise of any criminological theory. As every student who takes introductory criminology quickly learns, sometimes with dismay, there are literally dozens of answers. Criminologists have developed a multitude of theories, in large part because crime and delinquency are extremely complex social phenomena. Even to ask why some people commit crimes presupposes that there are answers to a host of other additional questions -- about *what* crime is, *who* commits it, when, where, and under what circumstances. Yet these factual building blocks of theory may seem quite different for specific crimes. Who commits armed robbery, for example, when and under what circumstances, might appear to be quite distinct from who abuses drugs; and if that indeed proves to be the case, how can there be a common explanation that addresses the motivation for both behaviours?

Some contemporary criminologists, faced with the complexity of criminal behaviour, and cognizant of the social context that shapes the definition and understanding of crime, have concluded that there *is* no single theory that can account for all crimes. "Crime" is too general a category; the best way to explain what is really a multidimensional spectrum of distinct behaviours is with diverse theories (Cornish and Clarke 1986; Silverman et al 1996). Specific theories might help explain the tendency to commit white-collar crime, but offer little insight into the dynamics of urban gangs; or might address vandalism but not sexual assault. There may even be more than one explanation that fits some types of crime or delinquency in different circumstances.

Not all criminologists, however, have embraced this trend towards diversity. In the last decade, several important works have revived the single-cause explanation for criminal behaviour. One of the most articulate and influential of these is Michael Gottfredson and Travis Hirschi's *General Theory of Crime* (1990). According to these authors, crime is not multidimensional. All crimes have certain features in common, and all are manifestations of a single, underlying behavioural propensity. In spite of their seeming diversity, all crimes offer immediate, short-term solutions to needs and desires. They are most likely to be committed by people who lack the ability to make long-range plans and to defer gratification -- people who have failed to develop the critical quality of *self-control* (Gottfredson and Hirschi 1990). Self-control, Gottfredson and Hirschi suggest, must be acquired very early in childhood; and once formed, it remains stable and relatively immune to change. And it is *low self-control* that leads to the commission of delinquency, crime, and a wide variety of other equivalent actions. If the opportunity presents itself, low self-control individuals will be likely to commit any and all types of crimes, and will do so persistently and repeatedly.

Self-control is thus portrayed as "*the* individual-level cause of crime" (Gottfredson and Hirschi 1990:232). The common correlates of crime described by other theories as temporally-immediate causes are subsumed by self-control. Race, gender, school performance, employment, conditions of social structure, peers, family relationships -- all of these are relevant only to the extent that they reflect, contribute to, or attenuate self-control (1990:151-153). While actual patterns of offending may change due to circumstances and the effects of age, underlying *criminality* will not (Gottfredson and Hirschi 1990:253; Hirschi and Gottfredson 1986). Instead, it will continue to manifest itself in a variety of other, analogous behaviours that provide short-term gratification, often at the expense of long-term consequences -- excessive drinking, smoking, gambling, drug abuse, sexual promiscuity, and carelessness leading to accidents (1990:91-94).

General Theory is thus the archetype of a "grand narrative" of explanation, attempting to draw together all of the know facts about crime and delinquency (Ritzer 1992:494). Its depiction of causality stands in stark contrast to a host of other theoretical perspectives, both traditional and contemporary, and the decades of empirical research they have spawned -- a fact Gottfredson and Hirschi themselves unflinchingly confront in their review of what they describe as "positivistic social science"(Gottfredson and Hirschi 1990:82). Moreover, the theory has significant implications for criminal justice and crime prevention strategies. If, as the theory asserts, low self-control is the single cause of all crime, and if it remains resistant to change throughout the life course, then there is little point in trying to rehabilitate offenders or develop social programs on their behalf. The only way to deal effectively with low self-control individuals, Gottfredson and Hirschi argue, is incapacitation. Selective incarceration will keep high-risk offenders out of trouble until the inexorable effects of age eventually lead to a natural decrease in criminal activity (1990:269).

There is no question that *General Theory of Crime* is an important perspective, one that deserves careful scrutiny. As even its critics acknowledge, it represents a "milestone in criminological theory" (Akers 1991:201). Nevertheless, although it is one of the most widely-cited contemporary theories, only a handful of studies have been published testing its propositions (Arneklev et al 1993; Brownfield and Sorenson 1993; Creechan 1995; Grasmick et al 1993; Keane et al 1993; Kennedy and Forde 1995; Polakowski 1994). Each of these studies has found modest (Arneklev et al 1993; Brownfield and Sorenson 1993; Grasmick et al 1993; Kennedy and Forde 1995) or in some cases substantial (Keane et al 1993) support for the idea that low self-control leads to crime. Each, however, encountered specific problems in *measurement* of key concepts. In addition, several of these studies have raised questions about the way in which the theory addresses, or fails to address, the key issue of *opportunities* to commit crime.

General Theory makes a number of assumptions about the nature of criminal behaviour and its causes, however, that have not been addressed in empirical tests. Gottfredson and Hirschi's assertion of a universal *age effect* would suggest that, regardless of the age of respondents, the causal links between self-control and crime would be substantially the same; yet no research to date has compared different age groups. Moreover, some critics have accused *General Theory* of glossing over the controversial issue of *gender*, failing to adequately explain marked and widely-reported differences in male and female crime patterns (Miller and Burack 1993). Again, however, although several empirical tests have included gender as an exogenous variable, none have actually examined the relationship between it and other factors. Finally, Gottfredson and Hirschi's assertion that low self-control represents a *versatile* propensity that is the single cause of deviant behaviour, including *all* types of crime, has not been thoroughly explored. Each of these issues -- measurement of key concepts, the question of opportunity, age, gender, and the versatility of effects -- represents either lacunae in empirical tests of *General Theory*, or in the theory itself. Each, therefore, requires further consideration, and is discussed in greater detail below.

THEORETICAL AND EMPIRICAL ISSUES

Measurement of key concepts

It seems likely that one of the primary reasons researchers have devoted scant attention to many of *General Theory*'s corollary assertions is that most studies have experienced problems in measuring the concept of self-control. Several empirical tests of *General Theory* have measured self-control solely on the basis of a unidimensional personality scale incorporating such factors as impulsivity and the preference for risk-taking (Arneklev et al 1993; Brownfield and Sorenson 1993; Grasmick et al 1993). These traits are consistent with the concept of low self-control, and results of these studies suggest that they are predictive of criminal behaviour. In addition, impulsivity and risk-seeking are central causal factors in other perspectives besides *General Theory* (see, for example, Hagan et al 1979, 1985, 1989; Wilson and Herrnstein 1985). Exclusive reliance on a unidimensional personality measure, however, has been criticized by Hirschi and Gottfredson (1993) for equating self-control with personality. On the other hand, tests of the theory that have attempted to measure self-control by other means have also been confronted with difficulties. Some have employed relatively weak indirect indicators (Creechan 1995); others have used behaviours so closely associated with the crimes under investigation that it is uncertain whether the dependent and independent measures actually represent distinct domains of behaviour (Keane et al 1993).

An alternative way of measuring self-control, given the assertion that it is multifaceted, would be to use multiple indicators -- ones that do not closely overlap with the effects that they are expected to predict. One choice might be to use multiple measures of low self-control: either psychological manifestations such as impulsivity and risk-seeking as separate indicators, or analogous but non-criminal behaviours such as smoking and drinking, that are assumed to reflect low self-control, or both (Akers 1991:204; Hirschi and Gottfredson 1993). Only one test of the theory to date has employed several separate measures of the construct (Kennedy and Forde 1995). This study, however, was based on a sample of adults, whose criminal behaviour can be predicted to be substantially lower than that of juveniles. The widely-accepted and non-controversial fact of adolescents' greater frequency of offending (described as the "age effect" by Gottfredson and Hirschi) suggests that adolescents would provide a stronger basis for testing the assumptions of *General Theory*. Yet, somewhat surprisingly, few efforts to test the theory so far have been based on a sample of juveniles (Arneklev et al 1993; Creechan 1995; Grasmick et al 1993; Keane et al 1993; Kennedy and Forde 1995). Of the two published studies that have, one (Polakowski 1994) used diagnosed childhood behavioural disorders such as attention-deficit disorder and hyperactivity to predict later delinquency. This conception and operationalization of low self-control is problematic, however, because such disorders may well have a substantial neuropsychological component (a fact acknowledged by the author [Polakowski 1994:45]). The second study using an adolescent sample (Brownfield and Sorenson 1993) relied on a composite, unidimensional personality scale as a measure of low self-control, which as noted above may not be a satisfactory operationalization of the concept. In addition, it was constrained to using a relatively restricted range in the measurement of delinquency (Brownfield and Sorenson 1993:257).

Opportunity

A further issue raised in previous efforts to test *General Theory* arises regarding the role of opportunity. According to *General Theory*, crimes are specific acts of "force or fraud" committed in the pursuit of self-interest; criminality, by contrast, is the *propensity* to commit such acts (Gottfredson and Hirschi 1990:91-94). This distinction is a significant one, in light of Gottfredson and Hirschi's acknowledgement that the actual occurrence of crimes is shaped by a number of "necessary conditions," including opportunity (1990:137). Crimes are assumed to be "simple and easy" efforts at obtaining immediate gratification; it follows that objects to be stolen or persons to be victimized would be those most readily available, in situations where the offender does not expect to get caught (1990:92).

This reasoning closely parallels contemporary "routine activities" and opportunity perspectives that portray criminal events as the result of a *motivated offender* encountering a *suitable target*, in the absence of *capable guardians* (Cohen and Felson 1979; Felson and Cohen 1980; Sherman, Gartin and Buerger 1989). And in fact, Gottfredson and Hirschi acknowledge the affinity between opportunity theories and their argument, observing that the two viewpoints "are not necessarily inconsistent" (Gottfredson and Hirschi 1990:23). *Specific* crimes occur, then, not simply due to the criminality (low self-control) of the offender, but as a result of the interaction between low self-control and opportunity, as pointed out by Grasmick et al (1993). Gottfredson and Hirschi argue, however, that opportunities to commit deviance in *general* -- a variety of crimes or analogous acts -- are widespread (Hirschi and Gottfredson 1993).

Only a few of the researchers who have attempted to test *General Theory* have explicitly incorporated a measure of opportunity; these studies did not, however, explore the implications of opportunity in connection with other factors such as age and gender (Grasmick et al 1993; Kennedy and Forde 1995).

While an examination of the role of opportunity would seem to be relevant for subjects of any age, it is even more important if the subjects are juveniles. Youths do not have full autonomy and control over their lives, and their choices and actions are carried out within the context of adult restrictions and reactions. Numerous studies have identified weak parental supervision and monitoring as predictive of delinquency (Gove and Crutchfield 1982; Hagan et al. 1985, 1988; Hill and Atkinson 1988; Krohn and Massey 1980; LaGrange and White 1985). This type of supervision is often equated with social bond elements such as attachment, but in the context of *General Theory* can be seen as directly related to opportunity factors. Such elements of supervision, moreover, can be expected to vary with age, with younger teens supervised more closely than older ones; and this fact is important in light of the what Gottfredson and Hirschi describe as the "age effect" (Gottfredson and Hirschi 1990:254).

Age

Age is one of the best-established and least controversial correlates of crime, and has remained consistent through a century of empirical research. Adolescents on the whole commit far more crimes than any other equivalent age group in the general population, with frequencies increasing up to the mid-teens and then declining somewhat thereafter. Gottfredson and Hirschi describe this phenomenon as the "age effect," and conclude that it is "invariant across social and cultural conditions" (Gottfredson and Hirschi 1990:128; Hirschi and Gottfredson 1983). While several other theoretical perspectives have argued that age exerts different effects for different types of crime, Gottfredson and Hirschi conclude that such apparent differences can be attributed primarily to the circumstances and situations that surround specific incidents -- in other words, opportunity (1990:127-128). Moreover, they deny that the gradual decline in crime that accompanies age is due to any significant causal forces (Sutherland and Cressey 1978), to the gradual assumption of adult responsibilities and roles (Sampson and Laub 1993; Thornberry 1987), or to "maturational reform" (Matza 1964). Instead, it occurs primarily as a result of "the inexorable aging of the organism" (Gottfredson and Hirschi 1990:141). Criminality or low self-control, they stress, remains unchanged, but finds more frequent expression in the analogous behaviours previously noted.

The significance of age (or its relative lack of significance, in Gottfredson and Hirschi's causal model), has been given little attention in empirical tests of the theory, a fact that is no doubt due in part to the relatively few studies that have been based on juvenile samples. Given the age distribution of offending, it would seem imperative to use adolescent subjects as a sample, and moreover to evaluate the interaction between age and other factors, particularly opportunity.

Gender

Along with age, gender is one of the most unvarying and persistent correlates of crime, and it is one that has been the subject of a vast array of journal articles, books and essays over the last two decades. A number of researchers have argued that male and female rates of offending are converging (Adler 1975, 1977, 1981; Simon 1975, 1979); others argue just as adamantly that they are not (Chapman 1980; Steffensmeier 1979, 1980, 1981, 1989). A similar lack of consensus occurs with respect to the underlying reasons for gender discrepancies in offending (Canter 1982a, 1982b; Cernkovich and Giordano 1987; Hagan et al 1979; Hagan 1989).

In spite of the controversy surrounding the significance of gender, Gottfredson and Hirschi devote only a brief discussion to it. Their argument is more equivocal on this point than on other correlates (particularly age and race), and they acknowledge that the implications of gender as a factor have not been empirically explored. Nevertheless, *General Theory* argues that differences in male and female crime rates can be interpreted within the context of self-control, and the additional factor of opportunity. "Gender differences appear to be invariant over time and space," according to the authors (Gottfredson and Hirschi 1990:145), with males consistently more likely to commit delinquent or criminal acts. Moreover, analogous behaviours that stem from low self-control are similarly marked by gender discrepancies, with males more likely to abuse alcohol and drugs (1990:147). These differences, according to *General Theory*, are most likely the result of differential socialization of girls and boys (the implication being that girls in general may develop greater self-control), and differential opportunities in the form of supervision (Gottfredson and Hirschi 1990:149). Again, however, the interaction between gender and the effects of self-control and opportunity have not been explored in empirical tests of the theory.

The versatility of offending

According to *General Theory* the low self-control individual is likely to commit a variety of legal and non-legal acts that are equivalent in providing immediate, short-term gratification for desires -- including *all* types of crime (Hirschi and Gottfredson 1994; 1989; 1987). "The evidence of offender versatility is overwhelming," state Gottfredson and Hirschi (1990:91). This assertion contradicts not only the recent trend towards theoretical diversity, noted above, but also traditional theories dating back to Cloward and Ohlin's distinctive subcultures approach to delinquency (1960). *General Theory* argues that the correlates of all types of conventional crime are identical: the same individuals are likely to commit any crime ranging from theft to drug abuse, with seeming patterns of offence dictated by differences in opportunity rather than in differences in causality. All stem from the underlying dimension of low self-control.

Moreover, low self-control, is also assumed to lead to such legal indulgences as smoking and drinking, and "borderline" offences like parking "by a fire hydrant" (Wilson and Herrnstein 1985: 21). The difference, according to Gottfredson and Hirschi, is not one of kind but one of degree; "persons who park illegally in front of fire hydrants may share characteristics with people who rob banks" more than they do with persons who do neither (Gottfredson and Hirschi 1990:43). Based on this argument, it could be expected that no matter how crime is measured -- as all offences, property offences, drug offences, or violence; as serious crimes or minor crimes -- the causal forces would be virtually identical, consisting of low self-control and opportunity. Although some of the previous tests of *General Theory* employed separate measures of behaviour as dependent variables (Creechan 1995; Grasmick et al 1993), none of these studies used a sample of high-rate offenders (juveniles) in combination with a wide range of specific acts. Thus, none have been in a position to thoroughly examine the issue of versatility of effects.

THE CURRENT RESEARCH

Context and objectives

The issues briefly outlined above provide the context for the research reported in this thesis. An initial objective of this study is to conduct an empirical test of *General Theory of Crime* as an explanation for delinquency among a sample of adolescents, and to do so in a way that addresses the limitations of previous tests of the theory. At the same time, this research explores several of *General Theory*'s assumptions that have not previously been examined. Each of the concerns raised above -- conceptualization and measurement of low self-control, variation in the dependent variable, opportunity, age, gender, and versatility -- is considered, and to the extent possible, addressed. These factors provide the basis for a number of secondary objectives: (1) to empirically test the predictions of *General Theory* for different age groups; (2) to determine whether the theory can account for gender-based differences in patterns of offending; and (3) to evaluate whether the same causal factors account for different subtypes of offending, including property offences, drug offences, and violence.

The data for this research is taken from the *University of Alberta Study of Juvenile and Adolescent Behaviour*, a questionnaire survey of approximately 2000 youths conducted in Edmonton, Alberta in the fall of 1994. In order to overcome some of the difficulties associated with the measurement of low self-control, the current analysis employs several separate indicators of the construct: multiple psychological factors, obtained through principle-components factor analysis of a personality inventory, and self-reported smoking and drinking. Variation in the dependent variable, delinquency, is obtained by using a summed index of twenty specific items. In addition, the role of opportunity is examined by using several measures of freedom from parental and adult supervision. Finally, the interaction between self-control and opportunity is examined by constructing interactive terms from measures of these two concepts.

To address the secondary objectives regarding age and gender outlined above, the relationships between self-control, opportunity, and delinquency are analysed initially for the total sample, and then separately for younger and older teens, and finally for males and females. To examine the versatility of self-control's effects, a series of analyses are conducted using specific subtypes of delinquent behaviour (property offences, drug offences, and violent offences) as dependent variables.

Organization of the thesis

The results of the research reported in this thesis are organized as follows. In Chapter 2, the key assumptions and predictions of *General Theory of Crime* are discussed, and previous research empirically testing its central premises is reviewed. Based on this discussion, specific hypotheses are formed in order to evaluate the results of the subsequent multivariate analysis. Chapter 3 outlines the method used in gathering the data, discusses the operationalizing of the concepts and measures used in the analysis, and reports the procedures used in the construction of scales and indices of concepts. Chapters 4, 5, and 6 report the results of the analysis. Initial results for the total sample and for the sample split on age are reported in Chapter 4. In the following chapter (Chapter 5), the analysis for males and females is reported; and Chapter 6 reports the results of separate analyses for delinquency subscales. The final chapter, Chapter 7, discusses the results, summarizes the findings, and addresses their implications, both for the theory itself and for future research.

CHAPTER 2

THEORY AND PREVIOUS LITERATURE

Some individuals are much more likely than others to commit crimes, according to *General Theory of Crime*, because they are deficient in self-control. As in Hirschi's earlier social bond theory (1969) and in other versions of control theory, the motivation to commit acts of force or fraud is not, in itself, a variable. All humans are assumed to have the motivation to satisfy their own desires, and to do so as quickly and as expediently as possible (Kornhauser 1978). Individuals do vary, however, in the extent to which they exercise restraint over this natural hedonism, and these variations remain stable throughout life. The capacity to restrain one's impulses, in turn, is seen as directly linked to early socialization, particularly in the family.

Family sources of low self-control

Low self-control, according to Gottfredson and Hirschi, is a consequence of inadequate family processes in early childhood. While they argue that several different aspects of family relationship are important in effective parenting, including the bonds of attachment that Hirschi's earlier theory emphasized, General Theory focuses on discipline as the most relevant to the development of self-control (1990:97-104). During early childhood, parents who provide consistent discipline when children misbehave teach them restraint, so that as they grow older they learn to defer gratification and to consider the consequences of their actions. This type of effective parenting is most likely to occur when parents recognize and respond to unacceptable behaviour, and consistently react to it with appropriate consequences. When parents fail to provide such discipline, however, or when it is too harsh (Zingraff et al 1993), children do not learn to curb their tendencies towards immediate, short-sighted solutions. They may act aggressively and display antisocial behaviour in childhood; and in their teens, these patterns continue and result in delinquency.

In support of this description, an extensive research program carried out by Patterson and his colleagues on the relationship between family dynamics and children's behaviour has consistently shown that parental disciplinary practices are associated with early patterns of aggression, impulsivity, and antisocial behaviour (Patterson et al 1967, 1975, 1985, 1989, 1991, 1993). Similarly, several decades of criminological research lend further support to this element of Gottfredson and Hirschi's argument, demonstrating relationships between parenting in early childhood and later delinquency (Farrington 1983; Glueck and Glueck 1950; Gove and Crutchfield 1982; Loeber et al 1986, 1987; McCord 1979, 1991; Nagin and Farrington 1992; Robins 1979).

General Theory does not identify these parenting factors as *direct* causes of crime, however. Their importance lies in their contribution to the development of self control. The age at which family socialization practices are most relevant is very early in childhood, long before the appearance of criminal propensities. By the time the child enters school, socialization and resulting self-control are assumed to be well-established and resistant to change. Early tendencies to ignore consequences, to take what is desired (by force if necessary), and to disregard other persons' property and feelings during childhood are assumed to generalize to a tendency to lying, stealing, shoplifting, robbery, or assault during the teen years and adulthood.

The actual sources of low self-control are therefore temporally remote from the behaviours that are assumed to be expressions of it; and this idea, in turn, provides the basis for the assertion that low self-control subsumes all other causal factors, and becomes the single cause of criminality. Various social-structural and cultural factors may affect family dynamics, which then shape self-control. Beyond that early period, however, the major determinant of self-control at any one age is self-control at the preceding age (Gottfredson and Hirschi 1990:102). Hence, by the time the child arrives at the high-risk years of the teens, the single relevant factor is assumed to be the extent to which he possesses the ability to restrain himself and exercise self-control.

The low self-control individual prefers "mundane, simple, trivial, easy acts aimed at satisfying desires of the moment," and is likely to indulge in a variety of behaviours that share these features, such as smoking and drinking (Gottfredson and Hirschi 1990:xv). In addition, a number of personality characteristics are assumed to be associated with low self-control: a tendency to act impulsively, and to prefer risky behaviours; displays of temper; a preference for simple tasks; and present- rather than future-oriented planning (Gottfredson and Hirschi 1990:89). These same qualities and tendencies make low self-control persons more likely to commit crimes.

Crimes are appealing because they are easy, and require little tenacity or persistence. In addition, they are often risky and exciting, so they appeal to persons who do not have much tolerance for boredom. The benefits tend to be immediate, rather than deferred; and little long-term planning is required to carry out most crimes. *All* crimes, Gottfredson and Hirschi stress, have these features in common; and therefore the person who lacks self-control is likely to commit *any* type of crime. He will be just as likely to abuse drugs, if they are readily available, as to shoplift from a store, steal a bike, or mug a pedestrian.

Empirical measurement of concepts

The above description summarizes the central proposition of *General Theory* -- that persons with low self-control have an enduring propensity to commit crime and analogous behaviours. Several empirical tests have been published in the last few years examining this idea, and in general these studies have supported at least some of their predictions based on *General Theory*. In two articles published by Arneklev, Bursik, Grasmick, and Tittle (Arneklev et al 1993; Grasmick et al 1993), a composite psychological scale representing low self-control was used to assess deviance among a sample of 395 Oklahoma City adults. In the first of these studies (Grasmick et al 1993), concepts of "force" (used or threatened to used force) and "fraud" (distorted or falsely represented something), taken from two questionnaire items, were used,as dependent variables. The second study used the same composite low self-control scale to predict the likelihood of engaging in imprudent non-criminal behaviours (smoking, drinking, and gambling), both separately and combined into a composite "imprudence" scale (Arneklev et al 1993:233). Each reports some results supportive of hypotheses derived from *General Theory*. In the first study, self-control was found to have a statistically significant effect on the likelihood of respondents' involvement in "fraud." In addition, the interaction between self-control and opportunity significantly predicted the likelihood of both "force" and "fraud" (Grasmick et al 1993:21). Similarly, Arneklev et al report that low self-control was associated with a modest increase in the scale measurement of imprudent behaviour, although not for each item separately (Arneklev et al 1993:235).

In a third study, Brownfield and Sorenson (1993) reanalysed data from the Richmond Youth Study (Hirschi 1969), basing their measurement of self-control on a composite scale similar to that employed by Grasmick et al, whom the authors cite (Brownfield and Sorenson 1993:252). Their dependent variables were the six-item scale of self-reported delinquency originally used by Hirschi (1969:54), containing responses to questions about theft, vandalism, and assault; and the number of officially recorded offences (Brownfield and Sorenson 1993:257). Again, these authors found some support for *General Theory* in the modest effects identified for the self-control index as a predictor of official delinquency, although effects were non-significant for self-reported delinquency (1993:260).

Each of these studies, however, employed a similar technique in the measurement of self-control, one that has been criticized by Hirschi and Gottfredson as a poor operationalization of the concept described by their theory. In both of the analyses reported by Arneklev, Bursik, Grasmick and Tittle, the authors used the same 24-item personality construct, taken from six subscales equated with traits assumed to be consistent with low self-control: impulsivity, a preference for simple tasks, risk-seeking, preference for physical activities, self-centeredness, and temper (Grasmick et al 1993:14-15). Although the authors used principle components factor analysis to assess the multidimensionality of these items, they opted for construction of "a single, unidimensional personality trait" comprised of all of them (Grasmick et al 1993:9). In the third study, Brownfield and Sorenson (1993) again used factor analysis of questionnaire items from the Richmond Youth Study to develop a similar composite measure of self-control.

In a commentary on empirical tests of their theory, Hirschi and Gottfredson criticize this approach, claiming that it equates low self-control with a "criminal personality" that predisposes towards crime (Hirschi and Gottfredson 1993:49). Self-control, they argue, cannot be viewed as a unidimensional construct. While representing a single underlying propensity, it might be expressed in multidimensional ways, ways shaped largely by situations and opportunity differences (1993:53). Just as low self-control persons may be more likely to commit crimes, they may similarly be more likely to display characteristics such as temper, impulsivity, a preference for risk-taking, and so forth. These traits can therefore be seen as byproducts of self-control, and the extent to which they occur does provide some indication of the construct. But these personality manifestations are not *equivalent* to low self-control; they are, at best, imperfect indicators of it.

Better indicators, according to Gottfredson and Hirschi, would be obtained from behaviours themselves rather than self-reported personality factors; and this is the approach taken by Keane et al (1993) in their study of over 12,000 Ontario drivers. In this analysis, low self-control was measured by a number of distinct behaviours: driving behaviours (seat-belt use), drinking behaviours (how much the subject drank in the past seven days), and drinking/driving behaviours (did anyone try to discourage you from driving?). A single measure of deviant behaviour was used as the dependent variable: subjects' BAC levels as an indication of the tendency to drive under the influence of alcohol (DUI) (Keane et al 1993:33). The authors report strong support for relationships between the predictors and the likelihood of driving under the influence, and therefore conclude that DUI behaviour is "impulsive, risky, hedonistic" and therefore consistent with *General Theory* (Keane et al 1993:42).

Yet, in spite of the strength of its results and the advantage to be gained from measuring self-control through behaviours, there is an inherent difficulty in the operationalization of the independent and dependent variables in this study. There is no clear evidence to support the conclusion that the behaviours used as predictors, all of which are conceptually linked to the dependent variable of drinking and driving (either as unsafe driving behaviours, or as drinking behaviours) reflect an underlying trait that carries over to other behavioural domains. Thus, the authors acknowledge the possibility of conflation between the independent and dependent variables (Keane et al 1993:35). Although they cite some previous research supporting the assumption that DUI behaviour is related to other types of crime (Argeriou et al 1985; Lucker et al 1991), and while Gottfredson and Hirschi's theory and its assumption of versatility would predict that drinking and driving *is* indicative of self-control in other activities, confidence in this assumption would be enhanced by a clearer distinction between measures.

Nevertheless, in spite of the possible conflation of measures, the strength of this study lies in its unique opportunity to use a behavioural indicator of self-control obtained through objective observation: the use of seat-belts. By measuring self-control in this way, the authors could circumvent some of the difficulties associated with self-report studies. The fact is, however, that sociological research is rarely conducted through the direct observation of subjects; a great deal of research in criminology, as in related disciplines, is constrained to use survey data in which respondents report on their own tendencies and actions. The problem, then, is how low self-control might best be measured based on this type of data. One possibility, as pointed out by Akers (1991:204) and also advocated by Hirschi and Gottfredson (1993:53), is to use minor, non-criminal deviant behaviours as indicators of low self-control to predict involvement in crime. This choice is particularly suitable for the study of adolescents, since these indulgences are prohibited for teens, and thus can be viewed as distinctly deviant while at the same time logically independent of crime. An additional technique might be to use multiple measures of low self-control, both in order to allow for the concept's putative multidimensionality and in recognition of any single measure's lack of clarity when used alone.

One of the few empirical studies to date that has used multiple indicators is Kennedy and Forde's analysis (1995) of offending and victimization among 2052 adult Canadians, which integrates concepts and hypotheses from *General Theory* with those of routine activities/lifestyles and conflict perspectives. While they utilize a personality-traits inventory analogous to that used by Grasmick et al (1993), discussed above, the measures from this scale are employed as distinct factors, thereby allowing for the possibility of multidimensionality. In addition, indicators of imprudent behaviours are introduced, based on four measures: smoking, drinking, speeding, and seatbelt usage (Kennedy and Forde 1995:20). These authors report only partial support for hypotheses derived from *General Theory*, in that psychological measures of low self-control predict imprudent behaviour, which in turn predicts crime; but psychological measures of low self-control were not found to have significant direct effects on the likelihood of crime (Kennedy and Forde 1995:26-29). The strength of effects in this study, however, might well have been attenuated by the measurement of the dependent variable as "arrests," a criteria which underestimates criminal behaviour (1995:21). Moreover, the sample consisted entirely of adults (median age 39), who are less overtly criminal than younger respondents.

General population samples of adults, particularly cooperative, stable populations that are used as the basis of adult sampling frames, have some difficulty in producing a sufficient number of high-rate criminal respondents to ensure an adequate distribution of the behaviours under study. Moreover, some commentators on self-report surveys have suggested that variation is further restricted by the diminished accuracy of information provided by those respondents who are most deviant, and therefore of greatest theoretical interest (Hindelang et al 1981). Hirschi and Gottfredson, similarly, argue that the lower the self-control of subjects, the less likely they are to provide reliable answers about themselves (Hirschi and Gottfredson 1993). Taken together, these factors might well severely limit the amount of variation in criminal behaviour reported. This, in turn, has implications for the reported effects; it is difficult to isolate clear effects and explained variance when there is, in fact, very little variance to explain.

Kennedy and Forde raise a significant issue, however: the extent to which respondents' own activities contribute to the likelihood of their involvement in criminal behaviour. Based on their inclusion of routine activities/lifestyles and conflict styles measures, the authors identify these situational elements as "proximate causes," concluding that "in order to be criminal one needs the *opportunity*," in addition to "the predisposition to do so" (Kennedy and Forde 1995:30-31; italics added). Grasmick et al

(1993) raise a similar concern, observing that their results reveal that crime opportunity, by itself, is predictive of a substantial increase in the likelihood of criminal acts, beyond the effect for low self-control and the effect for the interaction between low self-control and opportunity. Thus, they conclude that the theory pays insufficient attention to the role of opportunity, and that the effects of low self-control are contingent on the presence of opportunity (Grasmick et al 1993:22). The issue, then, is this: if one accepts the premise that low self-control renders individuals *more likely* to commit criminal actions, what role does opportunity play in the *actual occurrence* of their crimes?

The problem of opportunity

While low self-control is said to generate criminality, individual crimes are assumed to be discrete actions that are *expressions* of that criminality. The tendency for low self-control to manifest itself in crime, however, is not a result of some inherent trait or psychological predisposition such as aggression or impulsivity that *impels* the individual to crime (Gottfredson and Hirschi 1990:65). Rather, crimes are seen as resulting from rational considerations -- albeit considerations that are weighted in favour of immediate rather than delayed gratification and easy solutions (Gottfredson and Hirschi 1990:89; Hirschi 1986). The low self-control person can and does consider possible rewards and consequences; but he is likely to attach far greater weight to present, short-term rewards to be gained from crime and analogous behaviours, and far less to deferred or long-term consequences (Blumstein 1993).

Among the possible consequences that must be weighed is the possibility of detection and subsequent arrest. Stealing an unlocked bicycle from a dark, empty backyard is easier and hence more likely to be completed successfully than stealing a locked one from a busy street in the middle of the day. Similarly, shoplifting is more likely to provide immediate, short-term rewards if there appears to be little surveillance, either personal or electronic, in the potentially-targeted store. Thus, the nature of criminal acts is shaped, according to Gottfredson and Hirschi, by "activity, opportunity, adversaries, victims, [and] goods" (Gottfredson and Hirschi 1990:137).

This portrayal of the circumstances that surround the occurrence of specific crimes parallels that described by routine activities/lifestyles theories (Cohen and Felson 1979; Felson and Cohen 1980), as pointed out by Kennedy and Forde (1995). According to these perspectives, crimes occur when motivated offenders encounter suitable victims or targets, and do so in situations of reduced guardianship. The circumstances under which these conditions converge, however, are shaped by social structural factors that have very little to do with the inclination of potential offenders. The type of neighbourhood, the habits and movements of residents, the nature of the community in terms of business or recreational establishments, all contribute to the degree of guardianship and the availability of targets (Sherman and Buerger 1989). These factors, then, may play a significant role in the frequency and ease with which the low self-control individual can act on his inclinations. If, as *General Theory* asserts, crimes are committed when they are easy, simple, and require little planning, then it might seem logical to conclude that persons who live in certain areas of a city would encounter opportunities much more often than persons in other areas, and would therefore commit a greater number of crimes -- in spite of equivalent levels of self-control. Similarly, those whose lifestyles bring them into situations conducive to crime would be more likely to respond to the circumstances they encounter, and therefore be involved in more crime, than those with more constrained lifestyles.

Hirschi and Gottfredson agree that "opportunities to commit a *particular* crime may be severely limited," (Hirschi and Gottfredson 1993:50; italics added). So, for example, drug abuse is much more likely if the offender has easy access to drugs; driving under the influence of alcohol presupposes access to both a vehicle and alcohol; theft from an employer requires having a job; getting into frequent brawls may be a function of the extent to which one spends time in bars. Nevertheless, they assert that "opportunities to commit one or another crime or analogous acts are limitless" (1993:50). In effect, the low self-control person is virtually guaranteed to encounter *some* situations or circumstances where his propensity towards this type of action will lead to some form of deviance.

This argument implies, then, that the issue of opportunity is complex, and the extent to which it is important is a function of how, precisely, the dependent variable of crimes is conceptualized and measured. For non-criminal deviant behaviours, and for most minor offences, opportunity would seem to be of such limited importance that it can be viewed as a constant. Alcohol and tobacco, for example, are widely available, even for those for whom these substances are legally prohibited (juveniles); vandalism and theft require so little in terms of targets that, in the context of contemporary urban society, the element of opportunity might be, at best, minimal. The more specific the definitions of crime employed, however (armed robbery, for example), or the more restricted the categories (drug use, white collar crime), the more that opportunity could be expected to play a significant role in their occurrence. At the same time, the contribution of opportunity should *only* be in its interaction with low self-control. Persons with low self-control, encountering circumstances conducive to criminal actions, can be expected to take advantage of the situation; persons with higher self-control would be more likely to resist the situational temptations.

This argument, however, does not entirely account for the significance of opportunity by itself as a predictor of increased likelihood of crime, as identified by Grasmick et al (1993). In their commentary on this study Hirschi and Gottfredson (1993) devote little discussion to this finding, concentrating instead on the methodological shortcomings of the measurement of low self-control; and it might well be that the finding is an artifact of the way both "crime" and "crime opportunity" were conceptualized and measured. The issue thus remains unresolved. But a replication of these results, demonstrating that opportunity alone contributes to a greater likelihood of crimes occurring, would seriously challenge the assumptions of *General Theory*. The implication of such a finding is that situations and circumstances *by themselves* might contribute to the occurrence of crimes, beyond the relative inclinations of participants -- an assertion that is not inconsistent with routine activities theory. While some criminologists have dismissed as mechanistic the idea that behaviour can be generated by its circumstances (Cornish and Clarke 1986), constituting a form of "situational determinism," others assert that situations may actually contribute to the occurrence of crimes (Felson and Cohen 1980; Sherman, Gartin and Buerger 1989:46). If criminal events are the result of rational considerations, a weighing of costs (risks) and benefits, then situations and circumstances conducive to crime might do more than simply permit individuals to act on *pre-existing* inclinations. Such circumstances of opportunity might actually increase inclination by the temptations that they offer, and thereby lead to subsequent actions that might not otherwise have occurred (Cohen and Machalek 1988).

Opportunity and juveniles. Opportunity for juveniles incorporates a number of elements beyond the structural factors of available targets and guardianship that are seen as contributing to opportunity for adults. For adolescents, freedom to do as they please may be constrained by parental supervision. The degree to which parents monitor where teens are and who they are with can be expected to reduce the extent to which they encounter opportunities; when parents do not exercise this type of monitoring or when it is weak, opportunities can be expected to increase. In support of this, a large body of research has demonstrated that parental supervision is related to offending among juveniles (Canter 1982a; Gove and Crutchfield 1982; Hagan et al 1985, 1988; Hill and Atkinson 1988; Krohn and Massey 1980; LaGrange and White 1985; Rankin and Kern 1994; Stern and Smith 1995). For *General Theory* the significance of parental supervision is not as a reflection of the parent-child bond, so much as it is simply of opportunity. Those youths who are poorly supervised are more likely to be exposed to situations and circumstances that allow them, if they are so inclined, to commit delinquent acts.

In addition, many crimes occur at night, under the protective cover of darkness, and this is particularly true for the types of non-serious crimes most frequently committed by youths (Koenig 1987:246; Sacco and Kennedy 1994:134). Youths who are allowed to stay out late at night, therefore, can be assumed to have greater opportunity to commit delinquency, should they be so inclined. A final point, closely related to the preceding, is the extent to which youths have a great deal of free time to hang out with their friends. "Delinquency," Erickson and Jensen have observed, "is a group phenomenon"; young people commit the majority of their offences in the company of other young people (Erickson and Jensen 1977:262). While the actual reasons for this fact are hotly disputed, and have been the basis of one of criminology's most enduring controversies for decades, the group nature of delinquency is widely acknowledged. It might therefore be concluded that spending time with friends, in the absence of adult supervision, would enhance the likelihood of encountering opportunities for deviance, and can therefore be seen as an additional element of opportunity.

Although taken together these considerations can be seen as contributing to opportunity, it cannot be assumed that supervision by parents or other adults would completely eliminate all opportunities for delinquency, except in the unlikely cases of total seclusion or 24-hour surveillance. Even teens subjected to the most watchful and vigilant monitoring are likely to have periods of relative freedom -- on the way to and from school, on the weekend, during holidays. While their opportunities for certain *types* of deviance might be limited, some offences, such as vandalism and shoplifting, can be and are committed almost any place and at any time. How, then, does opportunity relate to the likelihood of offending for juveniles, from the perspective of *General Theory*?

It would seem that the situation for juveniles is generally analogous to that for adults. For delinquency in general, low self-control by itself should significantly predict greater delinquent involvement, because the highly criminal youth, even if he has reduced opportunities, will encounter some situations in which his propensities will be expressed. At the same time, increased opportunities can be expected to result in greater delinquency, but only in combination with low self-control; youths with higher self-control would be likely to resist the temptations of the situation. For specific measures of crime the situation might well differ, however. Opportunity and circumstances are important elements for some crimes, and this assumption, in turn, is central to *General Theory*'s explanation of the versatility of criminal behaviour, considered below. In addition, opportunity is of theoretical importance in the age distribution of offending, discussed in the next section; and for the different patterns of delinquency for males and females, as discussed in the following one.

Age and delinquency

Age is one of the most consistent correlates of crime, with official arrest statistics, self-report studies, and victimization surveys all revealing that adolescents are disproportionately likely to be involved in criminal activities (Hindelang et al 1979). For most offences, frequency of involvement peaks in the midteens and declines thereafter; for violent or personal offences, rates peak somewhat later, and decline more slowly. The reasons for these age relationships, however, have been the subject of debate. The gradual decrease that accompanies age has been attributed to maturational reform (Matza 1964) by some theorists. In addition, a number of researchers have identified transitions in the life course as being significant factors leading to desistance (Sampson and Laub 1993; Thornberry 1987). In their reanalysis of the Gluecks' longitudinal data on the criminal activities of 1000 subjects, Sampson and Laub conclude that "salient life events and social ties in adulthood can counteract, at least to some extent, the trajectories of early child development" (1993:304). Turning points such as marriage or stable employment, they argue, can redirect paths by increasing a person's commitment to the conventional social order.

A related developmental model has emerged from the recent interest in chronic offenders and criminal careers. Based on this research, some criminologists have concluded that the age-crime relationship is not universal for all delinquents (Blumstein et al 1986; Brennan et al 1989; Greenberg 1991; Nagin and Land 1993; Simons et al 1994). These researchers emphasize, again, that patterns evolve over the life course, with the age of onset and pathways to delinquency marking significant differences in the life trajectories of offenders. Youths whose criminal careers begin early in the teens are at greatest risk for becoming adult criminals, whose crime rates remain consistently high rather than diminishing. The majority of teens, however, commit less frequent and less serious crimes, and then "age out" of delinquency as they approach adulthood; it is this more usual pattern, this perspective argues, that accounts for the age effect in aggregate data (Dunford and Elliott 1984; West and Farrington 1977; Wolfgang et al 1972).

Gottfredson and Hirschi generally dispute the relevance of these developmental approaches to delinquency, however, concluding that for all offenders, regardless of their individual rate of activity, the age effect "is invariant across social and cultural conditions": both low-rate and high-rate offenders show a similar rise to peak in mid-adolescence, and a similar relative decline (Gottfredson and Hirschi 1990:128). Thus, the marked differences in their rates of offending would remain relatively consistent at different points in time. The so-called "age effect," they assert, is theoretically irrelevant in the study of crime; rather than being the product of variation in causal factors, it occurs as a result of "the inexorable aging of the organism" and to shifts in circumstances and opportunity (Gottfredson and Hirschi 1990:141). Criminality or low self-control is assumed to remain unchanged, but finds expression in the analogous behaviours of smoking, drinking, substance abuse, and similar non-serious deviant activities.

While this explanation is not entirely satisfactory,[1] disputes about the meaning and importance of the age effect are, to a great extent, beyond the scope of a cross-sectional study such as this one, since they centre around developmental processes that can only be addressed by longitudinal studies. The relationship between age and crime, however, is relevant to the current research with respect to the relationship between age and opportunity, and the expectation that when their effects are controlled, causal forces are similar for all ages. The actual extent and nature of crimes committed by low self-control individuals is shaped, Gottfredson and Hirschi argue, by circumstances associated with opportunity. While opportunities for crime in general are assumed to be omnipresent, the opportunity for specific types of crimes is dictated by the events, activities, and situations encountered by the potential offender. As discussed above, for juveniles opportunity may be constrained by parental and adult supervision; such supervision, however, is to some extent a function of age, with older teens afforded greater freedom than younger teens. Thus, older teens can be assumed to have potentially greater opportunities for crime. If Gottfredson and Hirschi's assertions about the universality of self-control as a causal factor are valid, however, when differences in opportunity and age are controlled, low self-control should be associated with greater delinquency very similarly for both older and younger teens.

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[1] Gottfredson and Hirschi's discussion of the "age effect" centres on their distinction between *criminality*, which remains stable throughout life, and *crimes*, which decline with age (1990:134-144). Keeping in mind the earlier and often-repeated assertion that crimes are to a large extent shaped by circumstances and opportunity, this explanation does little to clarify the issue. Do teens have greater opportunities to commit crime than do adults, particularly those in their twenties and thirties? The assumption that parental supervision restricts opportunity to a greater or lesser degree would suggest otherwise, but if teens do have greater freedom, then the fact that rates of offending peak in midteens, declining somewhat thereafter, would seem inconsistent. Nor does the conclusion that crime's decline with age is due to "aging of the organism" (1990:141) resolve the issue. The implication of this statement is that middle adolescence marks an apex of the life-cycle, perhaps in terms of energy, speed, ingenuity, and so forth. Not only is this disputable on physiological grounds; it also fails to explain, since crimes are "simple, trivial, easy acts," (1990:xv) why crime rates decline so substantially in the early adult years.

Gender

Male and female differences in rates of participation in crime have aroused considerable theoretical interest and controversy in the last few decades. Some criminologists have attributed marked gender differences primarily to opportunity, as a function of the social and economic roles females occupy in society (Adler 1975, 1977, 1981; Simon 1975, 1979). According to this argument, as these roles change, female rates will also change and converge with those of males. While some studies have supported this view, however, a number of others have not (Steffensmeier 1979, 1980, 1981, 1989). Although female crime rates have increased somewhat, as have female delinquency rates, the actual differences between males and females remain substantial. In one of the few theories that specifically incorporate an explanation for gender differences in offending, Hagan and his associates (Hagan et al 1985, 1987) argue that family class positions influence the way in which parents supervise their children, with greater supervision exercised over girls. Higher rates of male delinquency, they conclude, is a consequence of the freedom boys are permitted. While the argument they advance is more complex, their conclusion -- that as family supervision of males and females becomes more egalitarian, female rates will converge with those of males -- closely parallels that of opportunity-based explanations.

Gottfredson and Hirschi, however, dispute that differences in opportunity alone can account for gender-based crime rates (1990:145). Males are not only persistently more criminal than females; they are also much more likely to indulge in equivalent behaviours such as smoking and drinking -- behaviours which are so readily available, even for juveniles, that opportunity can be considered irrelevant (1990:147). Moreover, General Theory asserts that even where female opportunities have increased, female involvement in crime has not increased in proportion. Gottfredson and Hirschi argue, too, that an opportunity-based explanation could only be useful in reference to property crimes, not violent crimes. For personal offences, females are asserted to have equivalent opportunities to those of males, in that they spend equal or even greater amounts of time in the types of close contact with others that usually generate such offences (1990:147). They conclude, therefore, that gender-based differences in crime participation are due to a combination of differential socialization of males and females, and the element of greater opportunity. Stricter attention to females during early childhood, it is argued, may account for lesser criminal propensities at later ages -- in other words, girls may in general have greater self-control than boys. It is the combination of this factor with relative differences in opportunity, they speculate, that is most likely responsible for different male/female rates of offending.

Gender, age and opportunity. While females of all ages are assumed to be less delinquent than males, in addition there is some evidence that there is an interaction between gender and age. Hindelang (1981) reported some differences in delinquency for different age groups based on the offender's sex. Although the National Crime Survey (1973-77) data upon which these observations are based is biased with respect to age, since reported age of offenders is likely to be inaccurate based solely on victim assessment, that the age patterns of males and females appeared to differ is of interest, since presumably similar uncertainty about estimating age should apply to both sexes.

Moreover, the assertion of different age-sex rates is supported by self-report data. Gold (1970), for example, found different age-delinquency results for males and females. For boys, age was a more significant predictor, sharply increasing to a peak in the mid-teens and declining thereafter. For girls, delinquency was more evenly spread through middle adolescence. Farrington (1986) similarly found substantial differences in male/female rates at different ages. It might well be that these differences can be linked to supervision, in view of the links between parental supervision and delinquency identified in several studies (Cernkovich and Giordano 1987; Gove and Crutchfield 1982; Krohn and Massey 1980). Parental supervision tends to be more focused on girls, particularly in later adolescence. While both sexes may be more closely monitored in the early teen years, mid- to late-adolescence often results in greater relaxation of supervision for boys than it does for girls (Chesney-Lind and Shelden 1992).

Jang and Krohn (1995) report that for younger adolescents (up to age 15), parental supervision does significantly account for sex differences in delinquency. Thereafter, there is a declining significance of parental influences for both sexes, so that supervision differences do not account for differences in male and female delinquency. Overall, they conclude, there appears to be an interaction between age and sex in the likelihood of delinquency. This possibility, in turn, directly contradicts the assertions of *General Theory*. According to the argument advanced by Gottfredson and Hirschi, it can be expected that girls of all ages will be supervised more closely than boys (hence having reduced opportunity), younger teens will be supervised more closely than older teens, and older girls will be supervised more closely than older boys. Furthermore, girls are assumed to have been differentially socialized, so that they may in fact have a greater degree of self-control than boys of the same age. But consistent with the gender-invariance hypothesis, when teens of different ages and both sexes are examined separately, thereby controlling for the assumed differences in both self-control and supervision, low self-control should be associated with similar increases in delinquency for all groups.

Versatility of effects

Apparently distinctive patterns of offending that involve specific forms of crime and delinquency have been taken by some criminologists as evidence of offender specialization. Farrington et al (1988), for example, identified a subgroup of offenders in their longitudinal study of court-adjudicated delinquents who appeared to be specialists in specific types of offences. This type of specialization, in turn, has often been associated with the life course trajectories identified by criminal careers perspectives, based on the argument that different starting points or pathways to crime may lead to distinctive patterns of offending (Blumstein and Cohen 1979; Blumstein et al 1986). Other perspectives, particularly social learning and subcultural theories, have also proposed a similar type of offence specialization, albeit arriving at that conclusion based on different causal models (Cohen 1956; Cloward and Ohlin 1960; Sutherland and Cressey 1978; Elliott et al 1979, 1985).

While there is some evidence to support the idea of specialization in offending, particularly with specific habitual behaviours like drug abuse, the relevant issue is whether the *causes* of such behaviours are actually distinctive. The above theories have argued that they are; Gottfredson and Hirschi unequivocally assert that they are not. The indicators of crime and deviance are highly correlated, they argue; the same persons are equally likely to commit robbery, rape, or theft, and are just as likely to abuse drugs, drink and smoke. They are likely to commit these offences, moreover, for the same underlying reason: their relative lack of self-control (Gottfredson and Hirschi 1990:91-94).

Seemingly-distinct patterns of offending appear, according to Gottfredson and Hirschi, due to variations in opportunity and circumstances, which vary somewhat independently from the criminality of the individual (1990:248). Given that crimes are assumed to be trivial, easy acts, aimed at satisfying desires of the moment, it follows that the ease of committing a specific offence -- theft of a car, for example -- might well be a function of the immediate situational inducements (keys in the ignition, for example). Following the same logic, apparent patterns of specialization such as a penchant for robbing convenience stores may reflect nothing more than the fact that the offender, having previously succeeded at such an enterprise, finds it easy to repeat. Moreover, some general categories of offending such as drug abuse are particularly contingent on opportunity, since their availability is restricted.

Applying this argument to the offence patterns of juveniles, it can be argued that for property crimes, the most frequent offences for teens, opportunity is virtually unlimited; such offences as shoplifting, vandalism, and petty theft require little in the way of situational factors (although other more serious property crimes, such as car theft, depend on opportunity). To some extent, therefore, their occurrence may well be dependent on low self-control alone as the propensity to commit such actions. Personal offences such as assault, too, may be similarly predicted to some extent by low self-control alone. Some personal or violent offences are generated within the types of interrelationships that virtually all persons have, no matter what their circumstances and opportunities. Others, however, are contingent on opportunities such as being out on the street at night, and thus are dependent to a greater degree on the existence of circumstances conducive to their occurrence.

It might therefore be concluded that in the examination of specific categories of offending, low self-control by itself will be equally likely to predict property offences, drug offences, and violent offences. In addition, the interaction between low self-control and opportunity should similarly predict the likelihood of property offences and violent offences. The more restricted the categories of offence involved, however, the more that opportunity could be expected to play a significant role in their occurrence. Given that drug offences represent a special category that may be highly contingent on availability, it can be expected that low self-control in combination with opportunity would be a more important predictor for these offences than for general delinquency.

Based on the foregoing discussion of the significance of low self-control as the source of the propensity to crime, the complex role of opportunity as a factor relevant to age and gender differences in offending and in connection with versatility, the following hypotheses summarize the key issues to be investigated in this research.

HYPOTHESES TO BE TESTED

1. Measures of low self-control will significantly predict the likelihood of general delinquency. Consistent with *General Theory*, and keeping in mind that "general delinquency" includes a broad range of possible criminal acts, including minor ones, even the closely-supervised low self-control youth can be expected to meet with some opportunities for crime. Hence levels of self-control, alone, should lead to significant differences in the frequency of delinquent acts.

2. Measures of low self-control in combination with opportunity will significantly predict the likelihood of general delinquency. Although even a closely-monitored youth will encounter *some* opportunities for crime, those who are less closely supervised by parents or other adults can be expected to have substantially greater opportunities to act on their inclinations. It may be assumed, therefore, that the *interaction* between low self-control and opportunity would predict greater delinquent involvement. Opportunity alone, however, should have little effect, since the identification of low self-control as the source of criminality implies that those with greater self-control would not commit criminal acts, even if they had opportunities to do so. Hence when self-control and the interaction between self-control and opportunity are controlled, measures of opportunity alone should have no direct effect.

3. Measures of low self-control, and the interaction between low self-control and opportunity, will similarly effect the likelihood of general delinquency for teens of all ages. H1 and H2 above form the basis for examining the relationships between low self-control and delinquency for different age groups. The age effect implies that increasing age up to the midteens is associated with greater delinquency, while thereafter age is associated with an overall decline. At the same time, age leads to increased opportunity, in that older teens are supervised less closely. When the sample is split into age groups, however, there should be no substantial differences in the prediction of delinquency for younger and older teens. That is, low self-control will predict delinquency for both groups, when age and supervision are controlled. The interaction between low self-control and opportunity, also, should be similar for both groups. Although younger teens are expected to be more closely supervised, to the extent that they have opportunity, those with low self-control should be just as likely to act on it as older teens.

4. Measures of low self-control, and the interaction between low self-control and opportunity, will similarly effect the likelihood of general delinquency for both males and females. Again, this represents a corollary of H1 and H2. As with age, gender is associated with marked differences in supervision. In general girls are supervised more closely than are boys; and in addition this factor may vary according to age, with older boys accorded substantially more freedom from supervision (and therefore greater opportunity) than girls of the same age. Moreover, the theory argues that girls may be socialized differently from boys, so that girls may tend to have greater self-control. When these differences are controlled, however, effects should be similar. Thus when differences in supervision and relative self-control are controlled, lower self-control and the interaction between low self-control and opportunity should predict greater delinquent involvement for both boys and girls.

5. Measures of low self-control, and the interaction between low self-control and opportunity will similarly predict the likelihood of property crimes;

6a. Measures of low self-control will similarly effect the likelihood of drug offences, but

6b. The interaction between low self-control and opportunity will have a greater impact on the likelihood of drug offences;

7. Measures of low self-control and the interaction between low self-control and opportunity will similarly predict the likelihood of violent crimes. In keeping with the arguments made above regarding the versatility of low self-control's effects, the extent to which youths have low self-control should make it equally likely that they will commit property, drug, or violent offences. Opportunities for property offences are expected to be widely available, so that the extent to which low self-control and the interaction terms predict this type of offending should be similar to the effects identified for general delinquency. Opportunities for committing drug offences, however, may well be more restricted than for broader categories of offending; opportunity is therefore predicted to play a more significant role in their occurrence. Again, however, the prediction is that this effect occurs in interaction with low self-control. Opportunity, by itself, is not expected to have a significant effect on the likelihood of drug offences, since youths with greater self-control are expected to resist the temptations they afford. Violent offences, like property offences, are expected to require little in the way of opportunity; for this category, therefore, it is expected that the effects identified will closely resemble those seen for more general delinquency.

These hypotheses form the basis for the multivariate analysis discussed in the present research. The way in which each of these concepts is operationalized and measured is discussed in the following chapter.

CHAPTER 3

MEASURES AND METHOD

STUDY AND DATA

Data for this research was taken from the *University of Alberta Study of Juvenile and Adolescent Behaviour*, a cross-sectional survey of secondary-school students completed in Edmonton, Alberta in 1994. Edmonton is a medium-sized western Canadian city, with a population of approximately one-half million. Secondary schools in the City's public school district include thirteen senior high schools, serving grades ten to twelve, and thirty junior high schools for grades seven to nine. In addition, a separate Catholic school district includes six high school and ten junior high schools.

Selection of schools was initially based on school and neighbourhood vandalism rates, obtained from a previous study of vandalism patterns within the city (LaGrange 1994). Using these rates to distinguish between low- and high-vandalism areas as an indicator of delinquency, schools were selected to represent all quarters of the City, with oversampling of schools in high-vandalism areas. Within each school, cluster sampling was used across grades. Individual classes were selected from the language arts and social studies programs, which are required courses for all enrolled students, to ensure full coverage of each school's population and to eliminate possible overlap. A preliminary draft of the questionnaire was pretested in July of 1994, prior to preparation of the final version.

Questionnaires were administered in October and November of 1994 to students in fifteen schools: five public senior high schools, six public junior highs, two Catholic junior high schools, and two Catholic senior highs. Members of a team of trained graduate students visited each school, where participating students completed the questionnaire in their classrooms during one of their regularly-scheduled class periods of approximately 50 minutes. Of the 2,425 questionnaires completed, a total usable sample of 2,383 was obtained.

The *Juvenile and Adolescent Behaviour* study asked respondents a comprehensive range of questions about their personal characteristics, attitudes, peer relationships, school, and family. In order to examine the hypotheses derived from *General Theory of Crime* discussed in the previous chapter, sixty-five variables were extracted from the data set to measure family practices related to supervision and opportunities for crime, low self-control, and delinquency. Family supervision measures were combined into indices, as were the delinquency items; factor analysis was used to construct measures of the dimensions of self-control. These transformations, along with recodes and the computation of interactive variables, are discussed in detail below.

MEASURES

Self-control factors

Personality indicators of low self-control. Gottfredson and Hirschi's General Theory describes low self-control as the propensity to commit acts that provide immediate gratification, that are easy and do not demand long-term planning, and that are exciting. Although this stable propensity makes such individuals more likely to commit crimes, they are also likely to commit other non-criminal acts that share the same features. In addition, they are assumed to exhibit a number of personality characteristics consistent with low self-control. The traits most consistently associated with low self-control as described by Gottfredson and Hirschi include impulsivity, a preference for simple tasks and physical activities, a taste for risk-seeking, self-centeredness, and temper (Arneklev et al 1995; Grasmick et al 1993: 13-16; Kennedy and Forde 1995). The Juvenile and Adolescent Behaviour study contained an inventory of twenty-nine items that correspond to many of these traits, and these variables were examined to determine whether they could be combined into one or more measures of low self-control.

The majority of these questions were adapted from a subscale of the Basic Personality Inventory (Jackson 1986), measuring impulsivity.[2] The BPI impulsivity subscale, however, did not contain items reflecting all of the personality dimensions identified by Gottfredson and Hirschi as associated with low self-control. To address these omissions, eight additional items concerning "preference for risk-taking" (five questions) and "temper" (three questions) were included in the survey, adapted from Grasmick et al (1993).[3] The original coding of the dichotomous response categories provided for each of these questions assigned a value of 1 to "yes" and 2 to "no." For items to which a "no" response was consistent with lower self-control, original coding was retained. The remainder were recoded so that the higher value indicated lower self-control. Questionnaire items, along with their source, original coding, and recodes where applicable, are reported in Appendix 1.

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[2] Two additional items from the BPI Impulsivity scale were not included on the questionnaire.

[3] Although most items were used as presented in their sources, in some cases wording was slightly altered. These changes were undertaken based on the results of the pretest conducted in July of 1994, prior to final preparation of the questionnaire. One of Grasmick et al's "risk-seeking" questions stated "I sometimes find it exciting to do things for which I might get in *trouble,"* which was changed to read, ". . .for which I might get *caught."* This change was made in order to reduce the tendency for respondents to associate this question with the type of actions used to measure the dependent variable. Several other items, taken from the BPI Impulsivity subscale, were altered to make them more suitable and/or comprehensible for juvenile respondents. "I find it exciting to *drive* a fast car" was changed to "I find it exciting to *ride in or drive* a fast car"; and "I can work for a *reasonable length* of time without becoming bored" was changed to read ". . .a *pretty long amount* of time." And those items whose meaning might be unclear to the youngest readers, because they required agreement with a negative, were changed to read as simple positive statements: "I *would not do* something foolhardy for the fun of it" was changed to "I *might* do something. . ."; "Ideas *do not* race through my head faster than I can speak" was changed to "Ideas *race* through my head"; "I am *not* the type to be bored one minute and excited about something the next" was changed to "I *am* the type . . . ."; "I *never* take unnecessary chances" was changed to "I *sometimes* take . . . ."; and "I *seldom* do silly things without thinking" was changed to "I *sometimes* do silly things."

In order to determine the most suitable method of representing these variables, the twenty-six item inventory was examined using principle components factor analysis.[4] This analysis identified five factors, with eigenvalues ranging from 5.3 to 1.1. The difference in eigenvalues between the first and second factors of 3.5 represents a marked break, and in fact the first factor (*impulsivity*), accounts for almost half of the explained variance for these variables. Based on the scree discontinuity plot as a criterion (Cattell 1966), these observations could be seen as supporting a unidimensional measure of low self-control, the solution undertaken by Grasmick et al (1993). Yet re-evaluation of these items, with a forced single-factor solution, suggested that such a unidimensional model would best be achieved by the elimination of several key variables, particularly those for risk-taking behaviours and temper -- a solution that considerably weakened the data. In the absence of any compelling theoretical justification for adopting this approach (as noted in the previous chapter, Gottfredson and Hirschi argue against this measurement technique in their 1993 response to Grasmick et al), therefore, a multiple-factor solution was considered to be a more suitable approach. Further analysis of these variables using different extraction and rotation options produced essentially the same results, suggesting that the five-factor solution was the most valid representation of these variables. In the final analysis, principle components extraction and varimax rotation were used, with the resulting factors saved for use in the subsequent analysis using the regression method.

The five low self-control factors, reported along with their factor loadings in Table 1, consist of *impulsivity* (6 items); *risk-taking* (4 items); *carelessness* (5 items), *temper* (5 items); and *present-oriented* (4 items). Two additional items that had poor factor discrimination were eliminated, resulting in a final 24-item solution.[5] These five factors range in eigenvalue from 5.3 (for *impulsivity*) to 1.1 (for *present-oriented*) and in explained variance from 22.2 to 4.5 (for the same two factors); taken together, they explain 46.6% of the variance in these items. By far the strongest explanatory factor is the first one, *impulsivity*, which includes two items from Grasmick et al's risk-seeking scale, and three items from the BPI Impulsivity subscale.

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[4] The questionnaire contained three additional items that asked respondents to indicate agreement with the following: "I think I could . . . *break into a house*" (v272); ". . . *write graffiti*" (v285); and " . . . *steal something from a store*" (v286) ". . . and not get caught." The delinquency items used to construct the dependent variables in this analysis, however, contained items that asked whether respondents had actually *done* these things, raising the possibility of conflation between the dependent variables and their predictors. These questions were therefore dropped from this analysis.

[5] Variables eliminated were "Ideas race through my head faster than I can speak" (v273) and "At times I am rather sloppy (careless)" (v297).

TABLE 1
Personality factors

Means, standard deviations and factor loadings for
personality measures of low self-control

FACTOR AND ITEMS	*Mean*	*Std Dev*	*Factor Loading*	*Eigen-value*	*% Variance*
Impulsivity				5.3	22.2
v274 Sometimes I will take a risk just for the fun of it	1.56	.49	.72		
v288 I might do something foolish for the fun of it	1.59	.49	.66		
v270 I like to test my self every now and then by doing something a little risky	1.59	.49	.66		
v275 I sometimes find it exciting to do things for which I might get caught	1.35	.48	.58		
v292 I sometimes take unnecessary chances	1.48	.50	.54		
v299 I find it exciting to ride in or drive a fast car	1.58	.49	.54		
Risk-seeking				1.8	7.6
v282 The things I like to do best are dangerous	1.17	.38	.72		
v283 I often behave in a reckless manner	1.14	.34	.67		
v290 I'll try almost anything regardless of the consequences	1.15	.36	.64		
v276 Excitement and adventure are more important to me than security	1.20	.40	.57		
Carelessness				1.6	6.6
v296 I generally make careful plans*	1.36	.48	.73		
v294 I have a well thought-out reason for almost everything I undertake*	1.48	.50	.67		
v289 I am careful in almost everything I do*	1.35	.48	.66		
v291 I can work for a pretty long amount of time without becoming bored*	1.46	.50	.52		
v295 I often leave jobs unfinished	1.31	.46	.47		
Temper				1.4	5.7

FACTOR AND ITEMS	*Mean*	*Std Dev*	*Factor Loading*	*Eigen-value*	*% Variance*
v281 When I have a serious disagreement with someone, it's usually hard for me to talk about it without getting upset	1.63	.48	.60		
v277 I lose my temper pretty easily	1.39	.49	.60		
v280 Often when I am angry at people, I feel more like hurting them than talking to them about why I am angry	1.46	.50	.54		
v293 I am often somewhat restless	1.56	.50	.50		
v287 I am the type to be bored one minute and excited about something the next	1.69	.46	.48		
Present-oriented (no plan)				1.1	4.5
v278 I sometimes do silly things without thinking	1.77	.42	.69		
v279 Many times I act without thinking	1.53	.50	.60		
v298 I usually say the first thing that comes into my mind	1.47	.50	.55		
v271 I often take risks without stopping to think about the results	1.36	.48	.40		
TOTAL VARIANCE (N = 2158)					46.6

* For all items indicated with an asterisk, original coding was retained. All other items were recoded prior to analysis so that higher values were consistent with lower self-control.

The composition of these factors and factor loadings for specific questions represents a significant departure from those identified by previous research (Grasmick et al. 1993). These dissimilarities, however, must be interpreted in the context of differences in the present study. One important difference is in sample size, in that the present study is based on over 2,000 cases in contrast to Grasmick et al's 395. In addition, this analysis is based on adolescents rather than adults. Moreover, while there is considerable overlap between the BPI Impulsivity subscale that served as the primary source for this index and the self-control indices used in previous research, item content is not completely identical.

Smoking and drinking. In addition to these dimensions, low self-control was assessed with two behavioural items regarding respondents' smoking and drinking patterns. The tendencies to smoke and drink excessively are identified by Gottfredson and Hirschi as associated with low self-control; in addition, such behaviours are distinctively deviant for these adolescents, since in Alberta they are legally restricted for anyone under age 18. They are also conceptually distinct from delinquency, and do not overlap with any of the items used to construct the dependent variables. The survey had asked respondents "how often do you smoke cigarettes?" and "how often do you drink alcoholic beverages?" Five substantive response categories were provided for each question, ranging from "never" to "more than a pack a day" for smoking, and "never" to "every day" for drinking. Original coding was retained for these variables, so that higher values are consistent with lower self-control. The majority of respondents (80%) had answered "never" on each of these questions.

Opportunity

Based on the expectation that for juveniles living at home, opportunities to commit delinquency would be restricted by close monitoring from parents or other adults, and on the other hand would be greatly enhanced by the lack of such monitoring, eight questions about supervision were taken from the questionnaire as measures of opportunity. Six questions dealt specifically with parental contact and monitoring. Of these, four asked about parents' knowledge of where youths were during the course of a day, and who they were with; two asked respondents about whether or not they had a curfew. Two further questions dealt with adult supervision more generally, asking respondents about time spent with companions in the absence of adults.

Mother's and father's supervision. The four questions regarding parental supervision consisted of two items about *mother's supervision* ("in the course of a day, how often would your mother/female guardian know where you are?" and "how often would your mother/female guardian know who you are with?"), and two parallel questions about *father's supervision.* For each of these items, four substantive response categories were provided, ranging from "often" to "never." An additional category (scored as "5") permitted respondents to indicate that they had no parent or guardian of that sex. Original coding of these variables was retained, with the exception of the "no parent/guardian" category, which was recoded to "never." The two questions regarding mother's knowledge of activities and companions, and the two questions about father's, were highly correlated (r = .64 for mothers, and r = .83 for fathers), indicating that they might be combined into an index measuring a more general quality of supervision. Crohnbach's alpha as a test of inter-item reliability for the two questions about *mothers* was .78, well above a minimum acceptable criteria of .70 (Bohrnstedt and Knoke 1988:385), and these two items were summed as a measure of *mother's supervision*. For the same two questions about fathers, alpha was .91, and these two items were again summed as an index of *father's supervision*. The resulting scale on each of these measures ranges from 1 to 8.

Curfews. In addition to direct parental supervision in the form of knowledge of whereabouts and companions, two additional questions asked whether or not respondents had a curfew. One asked "do you have a set time to be home on school nights?" and the other "do you have a set time to be home on weekend nights?" The imposition of curfews, of course, might be seen as closely aligned to direct supervision, as measured by the previous questions. Yet parents may impose a curfew without any knowledge of where the youth is, or who with, prior to his/her return home at the set time; similarly, parents can have a general idea of who their children are spending time with, yet not establish a specific time for their coming in at night. That curfews and the measures of supervision discussed above measure conceptually distinct family practices is reflected in the bivariate correlations between these variables, which while statistically significant were much less substantial than correlations between the supervision measures discussed above (correlations ranged from r = .14 between "father knows who with" and "set time on school nights," to r = .20 between "mother knows who with" and "set time on weekend nights."). For these reasons, absence of a curfew is viewed as a separate measure of opportunity.

The two questions regarding curfews on school nights and on weekends both provided response categories of "yes" (1), "no" (2), and "don't know" (3). Each was recoded so that "no" responses were the higher value, consistent with greater opportunity. The ambiguous category of "don't know" was potentially problematic, however, since there was no way to determine *why* respondents might have chosen this category. It could not be eliminated by treating these responses as "missing" without a significant loss of cases, since 495 and 445 youths (for curfew on schools nights and curfew on weekends, respectively) had chosen this response. However, it was reasoned that those respondents with clear-cut and enforced curfews would answer "yes," while those whose parents made no effort to enforce a curfew, or youths who disregarded curfews, would accordingly answer "no." Youths who answered "don't know" might be assumed to be uncertain as to the rules or their consequences, or the issue might be inconsistent or irrelevant for them. These questions, therefore, were recoded so that "don't know" was the middle category, based on the assumption that such a response, whatever the specific reasons behind it, reflects an intermediate situation somewhere between a clear-cut "yes" or "no."

TABLE 2
Family variables

Means, standard deviations, and inter-item reliability for measures of family relationship

VARIABLES	*Mean*	*SD*	*Bivariate Correlation*	*Scale alpha*
Mother's supervision			.64	.78
In the course of a day, how often would your mother/female guardian know where you are?	1.45	.76		
How often would your mother/female guardian know who you are with?	1.71	.84		
Father's supervision			.83	.91
In the course of a day, how often would your father/male guardian know where you are?	2.23	1.09		
How often would your father/male guardian know who you are with?	2.36	1.07		
Curfew			.55	.71
Do you have a set time to be home on school nights?	.68	.82		
Do you have a set time to be home on weekend nights?	.98	.89		

Total N = 2158

Although the two questions regarding curfews were conceptually distinct from the other family supervision measures, they can be seen as closely related to one another, in that youths with a curfew for one type of situation would be more likely to have a curfew in the other situation. Their bivariate correlation (r = .55) confirmed that for many respondents this was indeed the case, and these two items were also combined into a two-item scale; the alpha for this scale is .71, as reported in Table 2. Scale values range from 0 to 4. While the descriptive term *curfew* is employed throughout this document for the sake of brevity, this measure (like *mother's supervision* and *father's supervision*) actually describes the relative *lack* of this sort of parental monitoring, rather than its presence. Higher values on these measures are indicative of reduced supervision, consistent with a greater opportunity for youths to engage in delinquency if they choose to do so.

Other opportunity measures. In addition to parental supervision and curfews, two other items regarding more general freedom from adult supervision were used as measures of the opportunity youths had to engage in deviant behaviour. One survey question had asked respondents "how often do you and a friend get together where no adults are present?" and a second question asked "how often do you and a friend drive around in a car with nowhere special to go?" For each, five substantive response categories were provided, ranging from "almost every day" to "never." These questions were viewed as conceptually distinct from one another, and also from the issue of curfews; youths might well hang out after school or during the evening without adult supervision, for example, and still return at a specific time set by their parents (bivariate correlations between "curfew on school nights" or "curfew on weekend nights," on the one hand, and "getting together with friends," or "driving around," on the other, were relatively modest, with the largest [r = .14] observed for "curfew on weekend" and "getting together with friends"). These two items were recoded so that higher values corresponded to greater frequency, consistent with more opportunity, and were retained as separate measures.

Exogenous variables

Five exogenous variables were adapted from the University of Alberta *Juvenile and Adolescent Behaviour Study* for inclusion in the analysis: age, sex, two categories of racial minority, and categories of mean neighbourhood income as an indicator of socioeconomic status. Age and sex were taken from two questions which had asked respondents to identify their age in years, and whether they were male or female. Sex was recoded as a dummy variable, with females as the reference category (0), so that in subsequent analyses the effects identified for sex represent the extent to which males differ from females.

Categories of racial minority were taken from a single question that asked respondents "to which ethnic or cultural group(s) do you or your family belong?" Fifteen specific ethnic/racial groups were listed as possible choices on the questionnaire, with a sixteenth category of "other" provided with instructions to describe the other response. Some ethnic/racial categories listed by respondents in the "other" category were sufficiently common to be separately coded into additional categories, so that the final data set lists twenty-one separate groups. Consistent with the demographic composition of Edmonton, two of the largest ethnic categories were persons of Aboriginal or Asian backgrounds. These are, moreover, the two ethnic minority groups of greatest theoretical interest from the standpoint of delinquency research in Canada (Gordon and Nelson 1996; Wood and Griffiths 1996). Race/ethnicity was therefore recoded into two dummy variables, one representing respondents who identified themselves as *Asian* and one representing those identified as *Aboriginal*, with all other (non-Asian or non-Aboriginal) responses coded as the reference category (0).[6]

Of the total 2,095 respondents, 339 (or 16.2%) were of Asian background; an additional 136 (6.5%) were Aboriginal,[7] and the remaining 1620 (77.3%) were non-Asian, non-Aboriginal ("other" on both dummy variables) (reported in Table 3). Seventy respondents who were over the age of 18 were eliminated from the analysis, and with one exception (discussed below) listwise deletion of missing cases was used, resulting in an effective sample size of 2,095. The sample consisted of 961 males (45.9%) and 1134 girls (54.1%) between the ages of 11 and 18 (Table 3).

An indication of the socioeconomic status of subjects' families was taken from information about the mean annual income for similar families in the respondent's neighbourhood. One questionnaire item had asked youths to indicate who they lived with, and a second item asked their postal code. During data entry, this information was cross-referenced to mean income for similar family type (distinguishing between single, single-parent/female, single-parent/male, two-parent) for each of the City's postal walks, obtained from Statistics Canada. For purposes of the present analysis, raw income estimates were recoded into 8 categories. The lowest category includes all those for whom mean neighbourhood income for families like theirs was less than $19,900, and the highest includes all those whose family/income was greater than $80,000. The remaining categories represent intervals of $10,000.

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[6] "Asian" was coded as 1 based on identification of a single response category, listed as "Chinese/Asian." "Aboriginal" was coded as 1 based on identification of any one of three response categories: "Inuit," "Native Indian," or "Metis."

[7] This figure differs substantially from the proportion of Aboriginals in the general population of Edmonton, which is usually reported as somewhere between 3 - 4%. Part of the difference may be due to the fact that subjects categorized as aboriginal in this research include all three groups of Native, Inuit and Metis. Some cultural anthropologists contend that official figures underrepresent the population of Native persons, and that "no one knows how many aboriginal people there are in Canada." Such ambiguity arises from a number of factors, including how the enumeration is conducted, and what criteria are employed in defining "Native" or aboriginal. Such counts usually do not include non-status Indians and the much larger group of Metis, both of whom were included here (Morrison and Wilson 1986:524).

TABLE 3
Sample characteristics
Data from University of Alberta Study of
Juvenile and Adolescent Behaviour (1994)

	Total sample		*Younger teens* (11-14)		*Older teens* (15-18)	
Sex:						
Males	961	*(45.9%)*	337	*(43.8%)*	624	*(47.0%)*
Females	1134	*(54.1%)*	433	*(56.2%)*	701	*(53.0%)*
Total	2095	*(100 %)*	770	*(100 %)*	1325	*(100 %)*
Racial minority:						
Asian	339	*(16.2%)*	135	*(17.5%)*	204	*(15.4%)*
Aboriginal	136	*(6.5%)*	58	*(7.5%)*	79	*(6.0%)*
Non-minority	1620	*(77.3%)*	577	*(74.9%)*	1042	*(78.6%)*

For this variable a significant number of responses (325, or 13%) had been coded as missing. Listwise deletion of missing data, employed for all other measures in this analysis, would have resulted in a marked reduction in sample size. Some of these cases were coded as missing because the respondents did not know their postal code; others, however, were missing because the mean income data file to which postal codes were cross-referenced did not contain a figure for their family type. Neither of these situations was considered to provide an adequate theoretical justification for omitting these cases from the analysis. Hence, in order to retain them, missing values on this variable were recoded at the mean (category 4).[8]

Delinquency

The dependent variable in this analysis was measured by scores on a summed delinquency scale. Respondents to the University of Alberta study had been asked how many times during the last year they had committed twenty different delinquent actions, corresponding to crimes ranging from shoplifting to armed robbery. For each of these questions, response categories ranged from "never" (0) to "more than three times" (3). The most frequently reported of the delinquency items, "hitting someone to hurt them," was reported by 35% of respondents; the least frequent, "physically hurt someone to force them to have sex," was reported by less than 1%. In addition, six questions asked them to indicate how many times (actual count) they had committed six different types of vandalism. These six questions were summed and recoded using the same categories as provided for the delinquency questions, and then included as an additional delinquency item. Specific questions in the delinquency inventory and vandalism questions are listed in Appendix 1.

Responses to these questions were then evaluated for possible inclusion in a summed scale. The inter-item reliability (Crohnbach's alpha) for all twenty-one delinquency items (including vandalism) was .86. However, removal of the item for "hurting someone to have sex" improved the scale alpha to .87, and this item was dropped from the subsequent analysis. The remaining twenty items were summed to construct a general delinquency scale (*alpha* values for the general delinquency scale, and all subscales across all samples, as discussed below, are reported in Table 4).

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[8] An alternative technique would be to estimate probable scores based on subjects' responses on similar measures. Such an approach was not practicable for this data, however, since this variable provides unique information unavailable from other survey items. A second alternative would have required creating a dummy variable to evaluate the differences between the "missing" respondents and other subjects. This technique would be most appropriate for use with a theoretically-important measure, one used as the basis for hypothesis testing. Since mean neighbourhood income does not play a critical role in this analysis, and is employed primarily to control for its effects as an exogenous factor, this technique was not utilized.

TABLE 4
Delinquency scales

Inter-item reliability for delinquency and subscales of property, violence, and drug offences
Total sample and sample split on age and sex

		Scale inter-item reliability (alpha)			
	N	*Delinquency (20 items)**	*Property (10 items)*	*Drugs (4 items)*	*Violence (5 items)*
Total sample	2095	.87	.81	.71	.69
Sample split on Age					
Younger teens (11-14)	770	.85	.77	.66	.65
Older teens (15-18)	1325	.88	.82	.71	.71
Sample split on sex					
Females	1134	.82	.72	.64	.58
Males	961	.89	.83	.75	.72
Sample split on age and sex					
Younger females	433	.81	.71	.60	.59
Older females	701	.82	.74	.65	.57
Younger males	337	.86	.78	.72	.67
Older males	624	.89	.83	.75	.73

* Delinquency scale includes one item not included on subscales (v163: "in the last year, I have run away from home").

In addition to examining general delinquency as a dependent variable for the total sample, one of the objectives of the present research was to examine whether the assumptions of General Theory adequately explained delinquency for teens of all ages. With this in mind, the mean of delinquency by age was examined to determine the most appropriate age at which to split the sample into younger and older subsamples. For general delinquency, the peak age of offending for these respondents was 15. Fifteen-year-olds reported, on average, 5.8 delinquent acts, compared to the total sample mean of 4.8. By comparison, fourteen-year-olds reported a mean of 4.7 delinquent acts. After age 15, the mean of delinquency remained somewhat higher than for the total sample, with sixteen, seventeen, and eighteen-year-olds all reporting slightly more than 5 delinquent actions in the last year (5.4, 5.3, and 5.7, respectively). Fifteen therefore appeared to be the peak age of offending for these respondents. Moreover, it is generally the age at which young people move from junior high to high school, as they begin 10th grade -- a change that might well be accompanied by some relaxation in parental supervision. Based on these conclusions, the sample was split at fifteen, with fifteen-year-olds grouped with older teens. In addition, based on the further objective of comparing males and females, the sample was also subsequently split on gender. Finally, based on previous literature that has identified an interaction between age and sex, both of these variables were used as criteria for splitting the total sample into four subsamples: younger and older females, and younger and older males.

Previous research on the patterns of offending for males and females, however, and on the age distribution of various specific offences, would predict that younger teens and females would be more likely to commit some offences than others. For this reason, the reliability of the delinquency scale as a description of the offence patterns of various subgroups was scrutinized. As reported in Table 4, alpha values for the twenty-item general delinquency scale were acceptable for younger and older teens, and for males and females, exceeding .80 in each case.

Subscales. While all of the variables considered can be seen as reflecting a pattern of *general* delinquency, the issue remains of whether their is sufficient evidence to support the construction of subscales of specific offence patterns. To examine this possibility, the general delinquency scale was divided into categories of offence: property offences (10 items),[9] drug offences (4 items),[10] and violent offences (5 items).[11] [12] Given that the bulk of the crimes committed by teens are property offences, and that on this inventory half of the questions dealt with such offences, it might be expected that the property subscale would have adequate inter-item reliability for the total sample, and for all subsamples; and this proved to be the case. Alpha for the *property* subscale is greater than .70 in all cases. A subscale of *drug* offences, however, does not meet the minimum criteria of acceptability in the case of younger teens, and for females. This observation suggests that for these groups, the occasional drug-related offence may be consistent with an overall pattern of general delinquency, but does not necessarily reflect a more distinctive behaviour. A summed drug scale was therefore not used as a dependent variable in the subsequent regression analyses for these groups. Similarly, the *violence* subscale has sufficient inter-item reliability for older teens, for males, and for older males, but not for younger teens or for females.

The logic of scale construction is that each of the specific component items are manifestations of a more general, underlying concept, one that is represented by the composite scale. Based on this reasoning, delinquency is seen as a behavioural pattern, one that may manifest itself in occasional acts of shoplifting, or assault, or drug use. These items, therefore, should be highly correlated, suggesting that respondents who report shoplifting are also more likely to have engaged in such behaviours as assault. The same logic applies to subtypes of behaviour, such as violence or drug use. Construction of a violence subscale, for example, presupposes that respondents who have committed assaults will also be more likely to have committed other types of violent or personal offences. For females, and for younger teens, as noted above, this assumption was not supported. The occurrence of these offences is relatively infrequent among these respondents, and where such incidents occur they are consistent with a pattern of overall delinquency, but not necessarily with any greater likelihood of other violent behaviours. The same is true for drug offences for these subsamples of respondents -- such offences are relatively infrequent, and where they occur they are correlated with other forms of delinquency, but not specifically with other types of drug offences. These findings are consistent with previous research on the age and gender distribution of various types of delinquent offences (Canter 1982; Hindelang, Hirschi and Weis 1979; Simourd and Andrews 1996).

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[9] Items included as property offences: gone into a building to steal something; gone into a building to damage something; tried to steal or actually stole money or other things; shoplifted or taken something from a store on purpose without paying; stole someone's purse or wallet or picked someone's pocket; stolen something from a car that did not belong to me; tried to buy or sell things that were stolen; taken a car or motorcycle for a ride without the owner's permission; used or tried to use a credit card that I did not have permission to use; summed vandalism item.

[10] Items included as drug offences: used marijuana; used hard drugs like crack, cocaine, heroin, LSD or other non-prescription drugs; sold drugs such as marijuana; sold drugs such as crack, heroin, LSD, cocaine..

[11] Items included as violent offences: hit someone with the idea of hurting them; used a weapon (knife, bat) to hurt someone; been involved in a gang fight; used a weapon or force to take something from someone; thrown objects such as rocks or bottles at people.

[12] The general delinquency scale includes one item, "in the last year I have run away from home," not suitable for inclusion in any of these specific offence-category subscales.

While the majority of adolescents in this study had committed one or more delinquent offences in the last year (65%), the summed delinquency scale and each of the subscales were positively skewed. Each of the original items had a highest response category of 3 (3 or more times), so that the potential maximum for the summed general delinquency scale of twenty items was 60. For property offences, the maximum score was 30, for drug use 12, and for violence 15. To correct for the positive skewness, scores above the 90th percentile were recoded at that value (Nagin and Smith 1990). This technique resulted in a maximum of 16 for general delinquency; a maximum of 12 for property offences; a maximum of 4 for drug offences; and a maximum of 6 for violent offences.

Interaction terms

Based on the prediction that delinquency is most likely when persons with low self-control have greater opportunity, interaction terms were constructed for the seven measures of low self-control in combination with the five measures of opportunity by multiplying these terms together (Friedrich 1982; Jaccard et al 1990). The resulting interaction measures were then used as predictors of delinquency in the analysis.

To evaluate the hypotheses derived from *General Theory* discussed in Chapter 2, the relationships between low self-control, opportunity, and delinquency were analysed using multiple regression, with variables entered into each equation in three blocks. This technique permits an examination of the relative predictive power of the measures of self-control, opportunity, and their interactions by comparing the change in R-square for each successive block. *General Theory* predicts that self-control exists prior to any more proximate situations of opportunity; based on this assumption of time-order, all of the self-control measures and exogenous variables were entered in the first block, using the "enter" subcommand. In the next step, all opportunity variables were entered, again as a block using the "enter" subcommand. The interaction terms were then entered in the final step using the "forward" selection subcommand.

The construction of interaction terms from each of the seven measures of low self-control with each of the five measures of opportunity resulted in thirty-five interaction terms. Aside from the sheer number of these terms, which can be problematic in interpreting results, the forced entry of such a large number of variables can make regression equations and coefficients highly unreliable, since all of these terms are highly correlated with several others and with the original variables from which they were constructed. While forward selection for the block of interactive terms does not entirely eliminate the problem of collinearity between measures, it substantially reduces it, since only those measures with the largest partial correlation with the dependent variable are entered, based on default criteria.

CHAPTER 4

DELINQUENCY AND THE EFFECTS OF AGE

General Theory argues that low self-control is the source of the inclination to commit criminal or delinquent acts. The actual occurrence of such actions, however, is shaped to a large extent by opportunity. As discussed in Chapter 2, opportunity for juveniles may be greatly restricted by the degree to which they are subjected to parental and/or adult supervision. In addition, the frequency of offending is effected by age and gender, and both of these factors in turn effect the level of supervision teens experience. In spite of such differences, however, the theory predicts that low self-control teens of any age and either gender will be likely to commit delinquency to the extent that they have the opportunity to do so. Thus the initial analysis reported in this chapter examines general delinquency for the entire sample, using the multiple regression method outlined in Chapter 3, with age and gender controlled by including them as exogenous variables. Age, however, is assumed to have a non-linear relationship with the frequency of offending. It is expected to be associated with an increase up until the midteens, and then a slight decrease thereafter. Thus, the subsequent analysis examines delinquency among two age groups: younger teens (11-14) and older teens (15-18), with age again introduced as an exogenous variable in each analysis.

TOTAL SAMPLE

Descriptive statistics

The means, standard deviations, minimums and maximums for the measures and composite scales used are reported in Table 5. For the total sample of 2,095, means of the five personality indicators of low self-control are at or near zero, the expected consequence of the factor-analysis method used in their construction. The means for smoking and drinking are both slightly less than 1 on a five-point scale, indicating that the majority of respondents had reported relatively infrequent indulgence in these behaviours. Respondents reported committing, on average, about 5 delinquent actions during the past year.

TABLE 5
Descriptive statistics

Means and standard deviations for measures of self-control, family relationship, and delinquency

			Means and standard deviations					
			Total sample (N = 2095)		Younger (11-14) (N = 770)		Older (15-18) (N = 1325)	
	Min	*Max*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Impulsivity	-2.45	2.26	.02	.97	-.17	.98	.13	.95
Risk-seeking	-1.63	3.77	-.02	.96	-.04	.90	-.01	1.00
Temper	-2.84	2.44	.00	.98	-.04	.98	.02	.97
Carelessness	-1.76	2.37	-.01	.97	-.02	.96	-.01	.98
Present-oriented	-2.98	2.51	-.01	.97	.03	.96	-.03	.98
Smoking	.00	5.00	.94	1.58	.47	1.11	1.22	1.73
Drinking	.00	5.00	.90	1.17	.44	.90	1.17	1.23
Age	11.00	18.00	15.00	1.83	12.93	.91	16.19	.98
Curfew	.00	4.00	1.67	1.52	1.40	1.36	1.82	1.58
Together w/friends (no adults)	1.00	5.00	3.89	1.08	3.73	1.16	3.98	1.02
Drive around w/friends	1.00	5.00	2.07	1.25	1.49	.95	2.41	1.27
Mother's supervision	1.00	8.00	3.15	1.44	2.83	1.16	3.33	2.06
Father's supervision	1.00	8.00	4.57	2.07	4.21	2.02	4.77	1.58
Neighbourhood mean income (categories of $10,000)	1.00	8.00	4.04	1.59	3.99	1.37	4.06	1.70
Delinquency (total)	.00	16.00	4.83	5.39	3.63	4.71	5.53	5.64
Property offences	.00	12.00	2.89	3.76	2.10	3.17	3.35	3.98
Violent offences	.00	6.00	...	...	...	...	1.33	1.92
Drug offences	.00	4.00	.67	1.32	...	...	.93	1.47

Multiple regression analysis

Initial examination of the bivariate correlations between all measures and indices, reported in Appendix 2.1, revealed statistically significant relationships between the composite scale of delinquency and all predictor variables except mean neighbourhood income. The most substantial bivariate correlations are observed for the behavioural measures of drinking ($r = .54$, $p < .01$) and smoking ($r = .49$), and the personality factors for risk-seeking and impulsivity ($r = .41$ and $r = .39$). Each of the measures of opportunity had somewhat lower but still sizable bivariate correlations with delinquency, with the strongest relationship for mother's supervision ($r = .37$) and the second-strongest for driving around with friends ($r = .33$). Smoking and drinking behaviours are also significantly correlated with one another ($r = .56$), and with the personality factors of impulsivity and risk-seeking (ranging from .31 for drinking and impulsivity, to .19 for smoking and risk-seeking). Significant bivariate relationships are reported for smoking and drinking with each of the opportunity variables (with the largest occurring between driving around with friends and drinking, $r = .40$). In addition, the separate measures of opportunity all show modest, statistically significant bivariate correlations with one another.

Table 6 summarizes the results of regressing the composite measure of general delinquency on these predictors for the total sample. Summary coefficients for each block indicate *beta* values as each variable enters into the equation, and R-square for all variables entered up to that point. The last two columns report the final unstandardized (B) and standardized (b) coefficients for all variables when the effects of others are controlled. In the first block, consisting of exogenous variables and measures of low self-control, the strongest predictors appear to be the two personality factors of risk-seeking and impulsivity, with *beta* coefficients of .40 and .37 respectively. *Betas* for smoking and drinking, although somewhat smaller, are still substantial (.32 and .22), as are those for the two personality factors of carelessness and temper (.21 and .15). The R-square for the self-control variables and exogenous variables, taken together, is .53.

Entry of the second block of variables, containing the measures of opportunity, results in a very slight increase in R-square (.02), to .55. The largest *beta* coefficients among this group of variables are reported for mother's supervision (.11), and father's supervision (.08). In the third block, forward selection of the interaction terms results in the entry of only one additional measure, for the interaction between mother's supervision and impulsivity ($b = .16$). The entry of this measure, however, does not result in any appreciable change in the value of R-square. Instead, its inclusion in the final equation results in a smaller coefficient for impulsivity alone. The final standardized coefficient for impulsivity ($b = .08$), while still statistically significant ($p < .05$), is much smaller than the coefficient reported in the first block, when self-control measures were entered alone ($b = .37$).

TABLE 6
Regression of delinquency on self-control and opportunity for total sample

Block summary and coefficients from multiple regression analysis

	Delinquency				
	(1)	(2)	(3) [a]	(4) B	*b*
Impulsivity	*.37*			.46*	*.08*
Risk-seeking	*.40*			1.44**	*.26*
Temper	*.15*			.60**	*.11*
Carelessness	*.21*			.72**	*.13*
Present-oriented	*.09*			.39**	*.07*
Smoking	*.32*			.71**	*.21*
Drinking	*.22*			.86**	*.19*
Sex	*.09*			1.01**	*.09*
Age	*.17*			-.09	*-.03*
Race/Asian	*-.11*			-.37	*-.02*
Race/Aboriginal	*.06*			.43	*.02*
Neighbourhd. Income	*-.04*			.02	*.00*
Mother's supervision		*.11*		.39**	*.11*
Father's supervision		*.08*		.15**	*.06*
Curfew		*.03*		.01	*.00*
Together w/friends		*.06*		.19*	*.04*
Drive around		*.04*		.15*	*.03*
*Mother's super*impuls.*			*.16*	.27**	*.16*
Rsq:	.53	.55	.55	Adj. Rsq:	.55

* p < .05 ** p < .01 (two-tailed)

Total sample N = 2095.

[a] Only those variables entered in final block shown.

The strongest predictor of general delinquency in the final regression equation is the personality factor of risk-seeking. Its standardized coefficient of .26 indicates that for these respondents, every standard deviation increase in the extent to which they reported preferring risky behaviours predicts an increase of about one-fourth standard deviation in the composite index of delinquency when the effects of the other predictors are controlled. Smoking and drinking behaviours are also strongly predictive of delinquency, with each standard deviation increase on the drinking scale predicting about one-fifth standard deviation increase in reported delinquency ($b = .21$); a similar increase is predicted from smoking ($b = .19$). The other measures of low self-control also reveal statistically significant effects on the composite measure of general delinquency, although the magnitude of coefficients is smaller.

In addition, a significant effect is evident for the interaction term, representing low mother's supervision with impulsivity ($b = .16$). Although both mother's and father's supervision are statistically significant, their coefficients are smaller than for the interaction term ($b = .11$ for mother's supervision, and $b = .06$ for father's). Of the other measures of opportunity, getting together with friends and driving around with friends are both statistically significant, but again their actual magnitude is small. Taken together, these measures account for 55% of the variance in the dependent variable of general delinquency, as indicated by the adjusted R-square; virtually all of this effect is associated with measures of low self-control and the exogenous variables, entered in the first block.

Hypotheses for general delinquency among the total sample. The first hypothesis derived from General Theory, as discussed in Chapter 2, had predicted that measures of low self-control would significantly predict the likelihood of delinquent behaviour. The effects identified for the measures of low self-control in this analysis, particularly the personality factor of risk-seeking and the behavioural measures of smoking and drinking, are statistically significant well beyond a minimum criteria ($p < .01$), providing strong evidence of a relationship between these measures and delinquency when other predictors are controlled. These results provide justification for rejecting the null hypothesis that the slopes are actually 0, and hypothesis 1 is supported. For these youths, the extent to which they report having a taste for risky behaviours, smoking, and drinking, provide a good indication of the extent to which they also report committing delinquency. Moreover, a substantial proportion of the effects can be attributed to low self-control alone, and is not contingent on opportunity, an observation that again is consistent with expectations derived from General Theory.

Hypothesis two predicted that measures of low self-control in combination with opportunity would significantly increase the likelihood of general delinquency. The interaction between mother's supervision as a measure of opportunity and impulsivity as an indicator of low self-control is statistically significant and of greater magnitude than opportunity measures alone. This finding suggests that when those youths who measured high on impulsivity also have the increased opportunity associated with lower supervision, they are more likely to commit delinquent acts than predicted by impulsivity alone, or opportunity alone. Thus, there is support in these results for rejecting the null hypothesis of no effect for hypothesis two.

SAMPLE SPLIT ON AGE: YOUNGER AND OLDER TEENS

Descriptive statistics

Splitting the total sample at age fifteen produced two groups, consisting of 770 younger teens aged 11 to 14 (mean age approximately 13) and 1,325 older teens aged 15 to 18 (mean age slightly over 16). Comparison of the descriptive statistics for these two groups, reported in Table 5, reveals a number of differences. Means for most of the personality factors are in general very similar; however, younger teens report a lower mean than older ones on the factor score for impulsivity (-.17 vs. .13), and for the behavioural indicators of low self-control.[13] The mean for smoking for younger teens is .47, while that for older teens is 1.22, a difference of .75. Similarly, younger teens were much less likely to report drinking (mean = .44) than older teens (mean = 1.17). The reported means for younger and older teens also differ markedly for all of the opportunity variables; and in each case these differences are also significant ($p < .01$). Younger teens were more likely to have curfews, less likely to get together with friends or drive around with their friends, and reported greater supervision from both mothers and fathers. Means for the composite scale of delinquency also differ; on average, the younger group reported committing 3.63 delinquent acts in the last year, while older teens reported a mean of 5.53.

The differences on measures of opportunity are consistent with previous literature that has identified age as an important factor in the degree to which teens are supervised, an issue discussed in Chapter 2. This finding, in turn, may account for the observed differences in the extent to which younger teens report smoking and drinking; closer parental supervision may prevent their involvement in these behaviours. This is not inconsistent with General Theory, however, in light of Gottfredson and Hirschi's assertion that low self-control is a behavioural *propensity* whose expression in specific behaviours is shaped by opportunity.

Multiple regression analysis for younger teens

Bivariate correlations for younger teens, reported in Appendix 2.2, reveal significant bivariate relationships between the composite scale of delinquency and all predictors except the dummy variable for race/Asian. The largest correlations are observed for drinking ($r = .53$) and smoking ($r = .50$), followed by the two personality factors of risk-seeking ($r = .43$) and impulsivity ($r = .42$). Smoking and drinking, in turn, are significantly correlated with almost all of the personality measures of low self-control (except for smoking with carelessness), with all of the opportunity measures except for that of curfew, and are highly correlated with one another ($r = .51$).

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[13] Differences between younger and older teens on impulsivity are significant ($t = -7.10$, $p < .01$), as are those for smoking ($t = -10.99$) and drinking ($t = -14.79$)

The results of regressing the composite delinquency scale on the predictor variables for younger teens are reported in Table 7. In the first block, consisting of measures of low self-control and the exogenous variables, the factor score for risk-seeking behaviour has the largest standardized coefficient ($b = .41$), followed by impulsivity ($b = .37$) and by drinking ($b = .31$). Introduction of this block results in an R-square of .55. The inclusion of opportunity variables, in the second block, results in an increase of .04 in R-square (Rsq. = .59); mother's supervision and getting together with friends have the highest coefficients among these measures ($b = .15$ and $b = .09$, respectively). For this younger group, forward selection in the third block results in the inclusion of nine interaction terms, and an additional increase in R-square to .62. The strongest of these, the interaction between mother's supervision and impulsivity, enters the equation with a *beta* of .33; interactions between getting together with friends and drinking, and father's supervision and drinking, also have large initial coefficients. Two of the interaction terms, however, are associated with negative coefficients: the interaction between father's supervision and smoking ($b = -.16$), and the interaction between driving around with friends and the personality factor of present-oriented ($b = -.09$).

The final effects reported indicate that smoking is the strongest predictor of general delinquency for younger teens. Its standardized coefficient of .42 indicates that each standard deviation increase in the extent to which youths report that they smoke is associated with about .4 standard deviation increase in self-reported delinquency when the effects of other variables are controlled. The extent to which youths report that they drink, and the factor score for risk-seeking, are also strong predictors of increased delinquency ($b = .29$, and $b = .24$, respectively, $p < .01$). Mother's supervision as a measure of opportunity predicts a modest increase in general delinquency, but its effects ($b = .14$) are surpassed by those reported for the interactions between mother's supervision and impulsivity ($b = .28$), driving around with friends and drinking ($b = .31$), and father's supervision and drinking ($b = .23$).

The factor score for impulsivity, which appears to be a strong predictor when entered along with other self-control variables in the first block, has a modest negative effect when the interaction terms are controlled, suggesting that impulsivity alone does not reliably predict the likelihood of delinquency. In addition, two of the interaction terms (driving around with friends and present-oriented, and father's supervision and smoking) have negative effects when other factors are controlled; for the latter of these, the coefficient is substantial ($b = -.29$). This apparently anomalous effect must be seen in the context of the low mean for smoking reported by these teens, and the fact that smoking alone is a substantial predictor of delinquent involvement. Overall, the measures of low self-control, opportunity, and their interactions account for a very substantial 61% of the variance in general delinquency reported by younger teens.

TABLE 7
Regression of delinquency on self-control and opportunity for younger teens
Block summary and coefficients from multiple regression analysis

	Delinquency				
	(1)	(2)	(3)^{a}	(4) B	*b*
Impulsivity	*.37*			-.77*	*-.16*
Risk-seeking	*.41*			1.29**	*.24*
Temper	*.21*			-.13	*-.03*
Carelessness	*.16*			.55**	*.11*
Present-oriented	*.18*			.26	*.05*
Smoking	*.18*			1.79**	*.42*
Drinking	*.31*			1.53*	*.29*
Sex	*.10*			.43	*.05*
Age	*.17*			.14	*.03*
Race/Asian	*-.06*			.36	*.03*
Race/Aboriginal	*.16*			1.00*	*.06*
Neighbourhd. Income	*-.11*			.09	*.03*
Mother's supervision		*.15*		.57**	*.14*
Father's supervision		*.06*		.13	*.05*
Curfew		*.04*		.05	*.02*
Together w/friends		*.09*		.21*	*.05*
Drive around		*.04*		.03	*.01*
*Mother's super*impuls.*			*.33*	.46**	*.28*
*Drive around*impuls.*			*.15*	.48**	*.17*
*Together/friends*drink*			*.32*	.36*	*.31*
*Father's super*present*			*.13*	.14*	*.14*
*Father's super*temper*			*.12*	.15**	*.15*
*Father's super*smoke*			*-.16*	-.20**	*-.29*
*Father's super*drink*			*.22*	.20**	*.23*
*Drive*present*			*-.09*	-.28*	*-.09*
*Curfew*temper*			*.06*	.16*	*.06*
Rsq:	.55	.59	.62	Adj. Rsq:	.61

* $p < .05$ ** $p < .01$ (two-tailed)

Younger teens (11-14): N = 770.

^{a} Only those variables entered in final block shown.

Multiple regression analysis for older teens

An examination of the bivariate correlations for older teens (Appendix 2.3) reveals a pattern very similar to that for the younger group. Almost all predictors have statistically significant bivariate relationships with the composite scale of delinquency; the exceptions for older teens, however, are mean neighbourhood income and age. As with the younger sample, the largest correlations are observed for drinking (r = .51) and smoking (r = .46), followed by the two personality factors of risk-seeking (r = .41) and impulsivity (r = .36). Smoking and drinking, as with younger teens, have a statistically significant bivariate correlation with most of the personality measures of low self-control, with almost all of the opportunity measures except for smoking with curfew, and with one another (r = .54).

The regression results for general delinquency among older teens are summarized in Table 8. As in the previous regression for younger teens, entry of the first block containing self-control measures and exogenous variables results in a substantial R-square (.51); the strongest *beta* coefficients among this group are for smoking (*b* = .46), risk-seeking (*b* = .32), and impulsivity (*b* = .26). Entry of the second block, containing measures of opportunity, contributes to a very small increase of .02 in R-square (Rsq. = .53), with mother's and father's supervision having the largest *beta* coefficients (*b* = .12 and *b* = .06, respectively). The final block, containing interaction terms, results in inclusion of the interactions between mother's supervision and impulsivity, mother's supervision and smoking, and curfew and risk-seeking; this block of variables does not, however, contribute to an increase in the reported R-square.

In the final equation, the strongest predictor of delinquency for these older youths is risk-seeking behaviour (*b* = .22), followed by drinking (*b* = .16) (p < .01 for both). Each of the terms measuring the interaction between self-control and opportunity is statistically significant, with the largest coefficients identified for the interactions between mother's supervision and smoking, mother's supervision and impulsivity (*b* = .11 and *b* = .10 respectively, p < .05). These variables account for about 53% of the variance in the composite measure of delinquency (Adj. Rsq. = .53), with by far the largest effects identified for the measures of low self-control.

Hypotheses for general delinquency among younger and older teens. The "age effect" identified by Gottfredson and Hirschi predicts that the expression of low self-control in the actual commission of delinquency follows a natural age curve, increasing up to a peak (in this case, 15) and then declining somewhat thereafter. When the sample is split on age, therefore, it can be expected that the effects of age within the two groups would differ, and this appears to be the case. For younger teens, age is associated with a small and non-significant increase; for older teens, age predicts a similarly small but statistically significant decrease. In addition, younger teens are expected to have greater supervision and therefore less opportunity than their older peers, and this expectation, as previously discussed, is borne out by the statistically-significant differences in means reported for the two groups noted above.

TABLE 8

Regression of delinquency on self-control and opportunity for older teens

Block summary and coefficients from multiple regression analysis

	Delinquency				
	(1)	(2)	(3)[a]	(4) B	*b*
Impulsivity	*.26*			.77**	*.13*
Risk-seeking	*.32*			1.24**	*.22*
Temper	*.07*			.52**	*.09*
Carelessness	*.18*			.78**	*.14*
Present-oriented	*.04*			.29**	*.05*
Smoking	*.46*			.43**	*.13*
Drinking	*.20*			.75**	*.16*
Sex	*.26*			1.41**	*.12*
Age	*-.05*			-.36**	*-.06*
Race/Asian	*-.09*			-.85**	*-.05*
Race/Aboriginal	*.01*			.03	*.00*
Neighbourhd. Income	*-.02*			-.05	*-.02*
Mother's supervision		*.12*		.23*	*.06*
Father's supervision		*.06*		.15**	*.06*
Curfew		*.03*		.01	*.00*
Together w/friends		*.04*		.09	*.02*
Drive around		*.05*		.21*	*.05*
*Mother's super*impuls.*			*.12*	.18*	*.10*
*Mother's super*smoke*			*.11*	.08*	*.11*
*Curfew*risk*			*.06*	.14*	*.06*
Rsq:	.51	.53	.53	Adj. Rsq:	.53

* p < .05 ** p < .01 (two-tailed)

Older teens (15-18): N = 1325.

[a] Only those variables entered in final block shown.

Nevertheless, when these differences are controlled, the effects of predictors on the likelihood of delinquency are expected to be similar; both of the first two hypotheses, therefore, should be supported within each group. The first hypothesis, as discussed above, stated that measures of low self-control would significantly predict delinquency. For both younger and older teens, the standardized slopes for several of the measures of low self-control are substantial, and the probability that they are actually zero is less than .01. There is therefore support for rejecting the null hypothesis. The second hypothesis, that low self-control in combination with opportunity would predict a significant increase in delinquency, also gains support from the statistically significant slopes identified for several interaction terms. Several of the opportunity variables predict a statistically significant increase in delinquency, when the interactions between low self-control and opportunity are controlled; however, their magnitude is generally smaller than identified for the interaction terms.

Comparison of younger and older teens. In addition to the expectation that measures of low self-control and their interactions with opportunity would predict increased delinquency for both groups, the effects were expected to be similar for both younger and older teens. Thus, while younger teens may smoke less, for example, an increase in smoking should predict, in general, a comparable increase in the composite measure of delinquency when the differences in age and opportunity are controlled. And although younger teens are more closely monitored than their older peers, when they do have freedom to act, those with low self-control in both age groups are expected to be delinquent to the same degree when age and opportunity are controlled. The third hypothesis, therefore, stated that *measures of low self-control and the interaction between low self-control and opportunity will similarly effect the likelihood of delinquency for teens of all ages.*

In general the patterns of effects identified for younger and older teens are very consistent. For both groups, measures of low self-control are associated with a substantial proportion of the explanatory strength of effects; and for both groups the factor score for risk-seeking behaviour and the behavioural measures (smoking and drinking) are highly predictive of delinquency. Similarly, for both groups the interaction between mother's supervision and the factor score for impulsivity has a strong effect, as does mother's supervision. However, in spite of these overall similarities, several differences are also apparent. Among younger teens, drinking and smoking are the strongest predictors of delinquent behaviour; for older teens, while they are statistically significant, the magnitude of effects is smaller. And while for both groups the interaction between mother's supervision and impulsivity predicts an increase in delinquency, the effect appears to be greater for younger teens. These differences might well be due to a number of factors, such as imprecision of measures or sampling differences. They may also reflect, however, the assumed multidimensionality of low self-control. Since all measures of this concept are assumed to be indirect expressions of it, it might well be that low self-control manifests itself differently under various conditions and circumstances, including age. Based on the similarity of overall patterns, with some indicators of low self-control and some interaction terms statistically significant for both groups, therefore, hypothesis 3 is supported by these findings.

CHAPTER 5

DELINQUENCY, OPPORTUNITY, AND GENDER

DESCRIPTIVE STATISTICS

In addition to examining the relationships between delinquency and low self-control for different age groups, as discussed in the previous chapter, one of the objectives of the present analysis was to compare males and females. Descriptive statistics for the 1134 females are reported in the first section of Table 9; those for the 961 males are reported in the second section. Means for all of the personality factors are different for the two groups, in some cases markedly so. For females, the mean score on impulsivity is -.07, compared to .12 for males, and this difference is substantial enough to be statistically significant (t = -4.45, p < .01). Mean female scores on risk-seeking (-.21) are also significantly lower than those for males (.21), and again this difference is significant (t = -10.80, p < .01). Substantial and significant differences are also observed for the personality factor of present-oriented (.06 vs. -.09; t = 3.58, p < .01). For the other two factor scores of temper and carelessness, the differences between males and females are small and non-significant.

Females, overall, reported smoking slightly more than males (.98 vs. .89), but this does not represent a significant difference. For drinking, however, the lower mean for females of .82 represents a statistically significant difference from the mean of .99 for males (t = -3.18, p < .01). The differences observed for the opportunity measures of curfew, getting together with friends, driving around, and mother's supervision are also statistically significant; there is, however, no substantial difference in father's supervision. Females reported, on average, 3.8 delinquent acts in the last year; males, on the other hand, reported over 6. These observations on gender-based differences in mean scores are consistent with previous literature that has found female children to be less delinquent than males, and to be more closely supervised, particularly by mothers, as discussed in Chapter 2. They also provide some initial support for the argument of differential female socialization, reflected in their reported lesser propensities for impulsive and risk-seeking behaviours.

TABLE 9

Descriptive statistics

Means and standard deviations for measures of self-control,
family relationship and delinquency for males and females

A. FEMALES

	All females (N = 1134)		Younger females (N = 433)		Older females (N = 701)	
	Mean	SD	Mean	SD	Mean	SD
Impulsivity	-.07	.98	-.20	1.00	.02	.96
Risk-seeking	-.21	.83	-.20	.78	-.22	.85
Temper	.03	.96	-.02	.96	.06	.96
Carelessness	-.05	.95	-.03	.96	-.06	.95
Present-oriented	.06	.95	.06	.92	.05	.96
Smoking	.98	1.58	.58	1.20	1.23	1.72
Drinking	.82	1.09	.47	.89	1.04	1.14
Age	14.94	1.84	12.93	.91	16.18	.98
Curfew	1.49	1.48	1.30	1.31	1.60	1.56
Together w/friends	3.74	1.12	3.55	1.19	3.85	1.06
Drive around w/friends	1.93	1.61	1.42	.84	2.25	1.22
Mother's supervision	2.93	1.35	2.69	1.03	3.08	1.50
Father's supervision	4.51	2.07	4.24	2.02	4.68	2.08
Neighbourhood income	4.10	1.57	4.15	1.34	4.06	1.70
Delinquency (total)	3.80	4.78	3.24	4.43	4.16	4.97
Property offences	2.18	3.21	1.87	2.93	2.37	3.36

Table 9 (cont.)

B. MALES

	All males (N = 961)		Younger males (N = 337)		Older males (N = 624)	
	Mean	SD	Mean	SD	Mean	SD
Impulsivity	.12	.95	-.13	.94	.25	.93
Risk-seeking	.21	1.06	.16	.99	.24	1.09
Temper	-.03	.99	-.06	1.01	-.02	.98
Carelessness	.04	.99	.01	.96	.05	1.01
Present-oriented	-.09	.99	-.03	.99	-.12	.98
Smoking	.89	1.57	.32	.96	1.19	1.75
Drinking	.99	1.25	.41	.91	1.30	1.30
Age	15.05	1.82	12.93	.90	16.19	.99
Curfew	1.87	1.54	1.51	1.42	2.07	1.57
Together w/friends	4.07	.99	3.97	1.07	4.12	.95
Drive around w/friends	2.23	1.32	1.56	1.07	2.60	1.31
Mother's supervision	3.41	1.50	3.02	1.28	3.61	1.56
Father's supervision	4.63	2.06	4.18	2.02	4.88	2.04
Neighbourhood income	3.98	1.61	3.80	1.39	4.08	1.70
Delinquency (total)	6.04	5.81	4.14	5.00	7.06	5.96
Property offences	3.73	4.16	2.40	3.45	4.45	4.33
Violent offences	1.76	2.13	...	...	1.88	2.17
Drug offences	.75	1.40	.21	.82	1.04	1.55

Multiple regression analysis for females

Bivariate correlations for females, reported in Appendix 2.4, reveal the same pattern of relationships as observed for the total sample, with statistically significant bivariate correlations between the composite scale of delinquency and all predictors. For females, as for teens more generally, the largest bivariate correlations with delinquency are identified for drinking (r = .53) and smoking (r = .52), followed by the two personality factors of risk-seeking (r = .37) and impulsivity (r = .38). Similarly, smoking and drinking are again found to be significantly correlated with almost all of the personality measures of low self-control (except for drinking with present-oriented [identified as "no-plan"]), with all of the opportunity measures except for curfew, and with one another (r = .57).

Section A of Table 10 summarizes the results of regressing the composite delinquency scale on predictor variables for females. The introduction of measures of low self-control and the exogenous variables, in the first block, identifies the factor score for risk-seeking behaviour as having the largest standardized coefficient (*b* = .41), followed by impulsivity (*b* = .38) and drinking (*b* = .32). Introduction of this block results in an R-square of .53. The second block, containing measures of opportunity, increases the R-square very slightly to .54; the largest coefficient is reported for mother's supervision (*b* = .10). Interaction terms introduced in the third block result in the inclusion of mother's supervision and impulsivity, and father's supervision and carelessness, and contributes to a small increase in R-square to .55.

In the final equation, risk-seeking behaviour is the strongest predictor of general delinquency for females (*b* = .27). Smoking and drinking behaviours are also identified as significant predictors, with coefficients of .21 and .20 respectively. As in the previous analyses, mother's supervision as a measure of opportunity predicts a modest increase in general delinquency, but its effects (*b* = .09) are substantially less than those reported for the interactions between mother's supervision and impulsivity (*b* = .23). The factor score for impulsivity, although identified as a strong predictor when entered along with other self-control variables in the first block, has a negligible and non-significant effect when its interaction with opportunity is controlled. The adjusted R-square of .54 indicates that these variables explain slightly more than 50% of the variance in the composite scale of general delinquency.

TABLE 10
Regression of delinquency on self-control and opportunity measures by sex

Block summary and coefficients from multiple regression analysis

A. FEMALES

	Delinquency				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.38*			.14	*.03*
Risk-seeking	*.41*			1.58**	*.27*
Temper	*.20*			.70**	*.14*
Carelessness	*.20*			.14	*.03*
Present-oriented	*.13*			.43**	*.09*
Smoking	*.32*			.65**	*.21*
Drinking	*.21*			.86**	*.20*
Age	*.04*			-.16**	*-.06*
Race/Asian	*-.09*			-.21	*-.02*
Race/Aboriginal	*.08*			.97*	*.04*
Neighbourhd. income	*-.08*			-.08	*-.03*
Mother's supervision		*.10*		.31**	*.09*
Father's supervision		*.04*		.09	*.03*
Curfew		*.02*		.02	*.01*
Together w/friends		*.04*		.08	*.02*
Drive around		*.03*		.10	*.02*
*Mother's super*impuls.*			*.24*	.36**	*.23*
*Father's super*careless*			*.13*	.13*	*.13*
Rsq:	.53	.54	.55	Adj. Rsq:	.54

* $p < .05$ ** $p < .01$ (two-tailed).

Females N = 1134.

[a] Only those variables entered in final block shown.

B. MALES

	Delinquency				
	(1)	*(2)*	*(3)* [a]	*(4)* *B*	*b*
Impulsivity	*.33*			1.49**	*.25*
Risk-seeking	*.29*			.18	*.03*
Temper	*.10*			.44**	*.08*
Carelessness	*.11*			.72**	*.12*
Present-oriented	*.07*			.80**	*.13*
Smoking	*.51*			.75**	*.20*
Drinking	*.22*			.80**	*.17*
Age	*.09*			-.01	*-.00*
Race/Asian	*-.10*			-.56	*-.04*
Race/Aboriginal	*.01*			.03	*.00*
Neighbourhd. income	*.01*			.09	*.03*
Mother's supervision		*.15*		.49**	*.13*
Father's supervision		*.08*		.24**	*.08*
Curfew		*.03*		-.03	*-.01*
Together w/friends		*.09*		.37**	*.06*
Drive around		*.04*		.16	*.04*
*Curfew*present-oriented*			*-.10*	-.22*	*-.09*
*Together*risk-seeking*			*.22*	.27*	*.22*
Rsq:	.51	.54	.54	Adj. Rsq:	.53

* p < .05 ** p < .01 (two-tailed).

Males N = 961.

[a] Only those variables entered in final block shown.

Multiple regression analysis for males

An inspection of the bivariate correlations for males, reported in Appendix 2.5, reveals very similar patterns of relationship to those found for females. Correlations between the composite scale of delinquency and all predictors except mean neighbourhood income are statistically significant, and as with females the largest coefficients are reported for drinking (r = .54) and smoking (r = .50), followed by the two personality factors of risk-seeking (r = .39) and impulsivity (r = .39). However, although for females smoking and drinking had statistically significant correlations with almost all personality factors, for males there are several bivariate relationships that are non-significant. As with females, however, the behavioural measures of low self-control are significantly correlated with one another (r = .56), and with all of the opportunity measures.

Results from regressing the composite measure of delinquency on all predictors for males are summarized in Section B of Table 10. In the first block, entry of measures of self-control and the exogenous variables identifies the highest standardized coefficient for smoking (*b* = .51), followed by the regression factor scores for impulsivity (*b* = .33) and risk-seeking (*b* = .19); reported R-square is .51. Entry of the second block with opportunity measures increases the R-square slightly to .54; as in all previous analyses, the largest coefficient is reported for mother's supervision (*b* = .15). Forward selection of the interaction terms in the third block results in the inclusion of getting together with friends and risk-seeking, and curfew and present-oriented (which enters a negative coefficient), but does not result in any appreciable change in the reported R-square.

The strongest predictor of general delinquency for males, in the final equation, is the factor score for impulsivity (*b* = .23), followed by smoking and drinking (*b* = .20 and *b* = .17 respectively). Although the factor score for risk-seeking was initially reported to have a strong effect in the first block, in the final results it is non-significant, a finding that may be attributed to the strength of the interaction between getting together with friends and risk-seeking (*b* = .22). Again, as for females and in all previous stages of the analysis, mother's supervision continues to be a significant predictor of the extent to which males report involvement in delinquency (*b* = .13). These measures of low self-control, opportunity, and their interactions explain about 50% of the variance in the composite scale of general delinquency for males (Adj. Rsq. = .53).

Hypotheses for general delinquency among females and males. Female children have been widely reported in previous literature to be more closely supervised than males; in addition, some researchers (including Gottfredson and Hirschi) argue that differential socialization results in females having a reduced propensity towards delinquency. Nevertheless, low self-control as a universal cause should predict delinquency for both males and females, when these differences between them are controlled. The first and second hypotheses should therefore be supported within each group. The first hypothesis had stated that measures of low self-control would significantly predict delinquency. In the results for both female and male teens, several of the measures of self-control, including the behavioural indicators of smoking and drinking, are statistically significant, and the associated probability is less than .01; thus the null hypothesis of no effect is rejected for both groups. The extent to which teens of both sexes lack self-control as measured by these variables, it appears, is a strong indication of their likelihood of being more delinquent. The second hypothesis stated that low self-control in combination with opportunity would predict a significant increase in delinquency, and is supported by the statistically significant effects identified for at least one of the interaction terms in each analysis, effects which surpass those identified for opportunity alone. At the same time, however, and consistent with each of the previous analyses, lack of mother's supervision as a measure of opportunity continues to have a modest, statistically significant effect for both sexes, even when the interactions between low self-control and opportunity are controlled.

Comparison of females and males. In spite of the assumed differences in socialization and supervision directed at female children, the way in which self-control translates into the likelihood of delinquency is expected to be similar for both sexes, when these differences are controlled. Hence, while females might have less of a preference for risk-taking behaviour, for example, the extent to which they *do* have such inclinations is likely to result in delinquency when differences in opportunity are accounted for. Conversely, while females may be more closely supervised than males, those with low self-control are expected to be similarly delinquent when differences in opportunity are controlled. Based on this reasoning, the fourth hypothesis proposed that *measures of low self-control and the interaction between low self-control and opportunity will similarly effect the likelihood of delinquency for both males and females.*

The overall pattern of effects for female and male teens does, in fact, appear quite similar. Measures of smoking and drinking, for both sexes, are associated with an increase in the dependent variable, and the magnitude of standardized coefficients is similar. In both groups, too, at least one of the interactions between measures of low self-control and opportunity predicts the increased likelihood of delinquency, as does mother's supervision as a measure of opportunity. There are, however, other effects that differ markedly when the two groups are compared. The most prominent is the differing importance of the two factor scores for impulsivity and risk-seeking. For females, risk-seeking is the strongest predictor of delinquency, with an unstandardized coefficient of 1.58, while for males it is weak and non-significant. While females in general were found to score substantially lower on risk-seeking than males, to the extent that some females score higher than others, they also report significantly more delinquency. While these differences are large enough to be statistically significant, *both* impulsivity and risk-seeking are assumed to be indicators of low self-control. Thus, these findings can be viewed as parallel to those observed for different age groups noted in the previous chapter. Given Gottfredson and Hirschi's assertion that low self-control is multidimensional, and in view of the argument that females are assumed to be socialized differently, it might be concluded that males and females express low self-control in distinctive ways; but low self-control leads to delinquency for both. Thus, the null hypothesis for H4 regarding similar effects is rejected.

AGE AND GENDER

Descriptive statistics

In order to evaluate the assertion of some researchers that sex and age interact, males and females were further split into two age groups, using the same cutoff age of 15 that was used for splitting the total sample. The resulting four groups consist of 433 younger females (11-14), 701 older females (15-18), 337 younger males, and 624 older males. Descriptive statistics for each of these samples are reported in Table 9. Means for younger and older females do not differ from one another a great deal for most of the personality factor scores, with the exception of impulsivity, on which younger females score substantially lower (-.20 vs .02). For smoking and drinking behaviours, however, differences are substantial and statistically significant, with younger females much less likely than older ones to engage in these behaviours (.58 vs. 1.23 for smoking, and .47 vs. 1.04 for drinking). All of the opportunity variables indicate that older females have slightly more freedom from supervision than do younger ones; however, while some of these differences are statistically significant, their magnitude is in fact very small, representing less than half a unit on each of the measures except for driving around with friends. Older females reported committing, on average, about one more delinquent act in the last year than younger ones.

For males, too, the difference in impulsivity scores that is reported for the two age groups is statistically significant (-.13 vs. .25); and again, as with females, older males are far more likely to report smoking and drinking than younger ones (.32 vs. 1.19 for smoking, .41 vs. 1.30 for drinking). For males, the differences reported in curfews, driving around with friends, mother's supervision, and father's supervision are all statistically significant, and moreover appear to be larger than the comparable differences for females, exceeding in most cases a half unit increase. Older males reported committing, on average, about 7 delinquent acts in the last year, a substantially greater number than reported by younger males (4.14), or for older girls (4.16).

When males and females are compared within age groups, several significant differences are apparent. Younger females, in general, score lower on preferences for risk-seeking (-.20) and higher on smoking (.58) than do younger males (.16 and .32, respectively). Older females also score significantly lower on risk-seeking, impulsivity, and carelessness, and higher on present-oriented, than older males. Differences in smoking are no longer significant for the older teens (1.23 for females and 1.19 for males), while differences in reported drinking are (1.04 and 1.30 for females and males respectively).[14] Younger females are significantly more likely to have curfews, less likely to drive around with their friends, less likely to get together with friends without adult supervision, and more likely to have close mother's supervision, than younger males. When older females are compared to older males, similar patterns of closer supervision are evident, with males accorded greater freedom on all measures, except again father's supervision.[15]

Multiple regression analysis for younger females

Bivariate correlations for younger females are reported in Appendix 2.6. The same general pattern of bivariate relationships is apparent for this group as for females in general, and indeed as for all of the youths in this sample, with statistically significant correlations between general delinquency and predictors; for younger females, however, the bivariate relationship with curfew as a measure of opportunity is non-significant. Largest correlations with delinquency are again seen for drinking ($r = .63$), smoking ($r = .61$), and the personality factors of risk-seeking ($r = .41$) and impulsivity ($r = .40$). Following the same pattern as females in general, smoking and drinking are significantly correlated with almost all of the personality measures of low self-control, except for drinking with present-oriented. In addition, these two behavioural measures are highly correlated with one another ($r = .63$) and with measures of opportunity except for curfew.

The results of regressing the composite delinquency scale on predictor variables for younger females are reported in section A of Table 11; and these results, again, parallel those observed for all females. When the first block containing measures of low self-control and the exogenous variables is introduced, the factor score for risk-seeking behaviour is reported to have the largest standardized coefficient ($b = .39$), followed by impulsivity ($b = .36$) and smoking ($b = .34$); R-square for this block of variables is .61. Entry of the second block with measures of opportunity increases the R-square very slightly to .63, with the largest coefficient identified for mother's supervision ($b = .13$). The final block, containing interaction terms, again increases the R-square very slightly, to .65. Six interaction terms are introduced in this step: mother's supervision and impulsivity, father's supervision and carelessness, father's supervision and temper, father's supervision and smoking, curfew and temper, and getting together with friends and drinking. The largest coefficients are associated with getting together with friends and drinking (*b* = .38), followed by mother's supervision and impulsivity (*b* = .28) and father's supervision and carelessness (*b* = .20); father's supervision and smoking enters with a negative coefficient (*b* = -.17).

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[14] Statistical significance of the differences in means for younger females vs. younger males on self-control measures, based on t-tests for equality of means, are as follows: risk-seeking, $t = -5.86$, smoking, $t = 3.09$ ($p < .01$); impulsivity, $t = -1.58$, carelessness, $t = -.50$, temper, $t = .64$, present-oriented, $t = 1.29$, drinking, $t = .65$, ($p > .05$ for all). For older females vs. older males, statistics are impulsivity, $t = -4.28$, risk-seeking, $t = -9.08$, carelessness, $t = -2.02$, present-oriented, $t = 3.50$, drinking, $t = -3.84$ ($p < .05$ for all); temper $t = 1.93$, smoking, $t = .55$, ($p > .05$).

[15] Statistical significance of the differences in means for younger females vs. younger males on opportunity measures, based on t-tests for equality of means, are as follows: curfew, $t = -2.27$; drive around with friends, $t = -2.14$; get together with friends, $t = -5.00$; mother's supervision, $t = -4.26$ ($p < .05$ for all); father's supervision, $t = .73$, $p > .05$. For older females vs. older males, statistics are: curfew, $t = -5.34$; drive around with friends, $t = -4.80$; get together with friends, $t = -5.09$; mother's supervision, $t = -6.49$ ($p < .05$ for all); father's supervision, $t = -1.44$, $p > .05$.

TABLE 11
Regression of delinquency on self-control and opportunity measures by sex and age

Block summary and coefficients from multiple regression analysis

A. YOUNGER FEMALES

	Delinquency				
	(1)	*(2)*	*(3)*[a]	*(4) B*	*b*
Impulsivity	.36			-.20	-.05
Risk-seeking	.39			1.24**	.22
Temper	.23			-.32	-.06
Carelessness	.23			-.28	-.06
Present-oriented	.16			.47**	.10
Smoking	.34			1.20**	.32
Drinking	.28			-.49	-.10
Age	.15			-.01	-.01
Race/Asian	-.02			.32	.03
Race/Aboriginal	.20			1.42*	.07
Neighbourhd. income	-.16			.00	.01
Mother's supervision		.13		.46**	.10
Father's supervision		.05		.16*	.07
Curfew		.01		.01	.00
Together w/friends		.08		.13	.03
Drive around		.05		.16	.03
*Mother's super*impuls.*			.28	.40**	.25
*Father's super*careless*			.20	.20**	.21
*Father's super*temper*			.15	.17*	.17
*Father's super*smoke*			-.17	-.11*	-.17
*Curfew*temper*			.11	.25*	.10
*Together*drinking*			.38	.43**	.38
Rsq:	.61	.63	.65	Adj. Rsq:	.64

* p < .05 ** p < .01 (two-tailed).

Younger females (11-14): N = 433.

[a] Only those variables entered in final block shown.

B. OLDER FEMALES

	Delinquency				
	(1)	*(2)*	*(3)* [a]	*(4)* *B*	*b*
Impulsivity	*.40*			.30	*.06*
Risk-seeking	*.35*			1.71**	*.29*
Temper	*.17*			.67**	*.13*
Carelessness	*.18*			.73**	*.14*
Present-oriented	*.11*			.43**	*.08*
Smoking	*.31*			.66**	*.23*
Drinking	*.18*			.73**	*.17*
Age	*-.04*			-.37**	*-.07*
Race/Asian	*-.15*			-.62	*-.04*
Race/Aboriginal	*.08*			.89	*.04*
Neighbourhd. income	*-.04*			-.10	*-.03*
Mother's supervision		*.09*		.29 **	*.09*
Father's supervision		*.03*		.06	*.02*
Curfew		*.04*		.06	*.02*
Together w/friends		*.00*		-.10	*-.02*
Drive around		*.04*		.12	*.03*
*Mother's super*impuls*			*.22*	.34 **	*.22*
Rsq:	.49	.50	.51	Adj. Rsq:	.50

* p < .05 ** p < .01 (two-tailed).

Older females (15-18): N = 701.

[a] Only those variables entered in final block shown.

C. YOUNGER MALES

	Delinquency				
	(1)	*(2)*	*(3)* [a]	*(4)* *B*	*b*
Impulsivity	*.44*			-1.76**	*-.33*
Risk-seeking	*.39*			.21	*.04*
Temper	*.16*			.61**	*.12*
Carelessness	*.18*			.64**	*.12*
Present-oriented	*.17*			-.77	*-.15*
Smoking	*.17*			.74**	*.14*
Drinking	*.24*			.69 **	*.13*
Age	*.12*			.15	*.03*
Race/Asian	*-.02*			.38	*.03*
Race/Aboriginal	*.08*			.77	*.05*
Neighbourhd. income	*-.05*			.30*	*.08*
Mother's supervision		*.17*		.63**	*.16*
Father's supervision		*.11*		.14	*.06*
Curfew		*.06*		.01	*.00*
Together w/friends		*.09*		.66**	*.14*
Drive around		*.01*		-.04	*-.08*
*Together*impulsivity*			*.52*	.63**	*.49*
*Drive*impulsivity*			*.18*	.58**	*.19*
*Mother's super*risk*			*.26*	.34**	*.26*
*Father's super*present*			*.27*	.30**	*.28*
Rsq:	.51	.55	.59	Adj. Rsq.:	.58

* p < .05 ** p < .01 (two-tailed).

Younger males (11-14): N = 337.

[a] Only those variables entered in final block shown.

D. OLDER MALES

	Delinquency				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.29*			1.35**	*.21*
Risk-seeking	*.29*			1.31**	*.24*
Temper	*.07*			.33	*.05*
Carelessness	*.15*			1.44**	*.24*
Present-oriented	*.03*			.72**	*.12*
Smoking	*.49*			.78**	*.23*
Drinking	*.22*			.76**	*.17*
Age	*.00*			-.36	*-.06*
Race/Asian	*-.13*			-1.11*	*-.07*
Race/Aboriginal	*-.01*			-.57	*-.03*
Neighbourhd. income	*.00*			.01	*.00*
Mother's supervision		*.14*		.44**	*.11*
Father's supervision		*.09*		.24**	*.09*
Curfew		*.03*		-.05	*-.01*
Together w/friends		*.09*		.38	*.06*
Drive around		*.06*		.27	*.06*
*Curfew*present-oriented*			*-.11*	-.24*	*-.11*
*Drive around*careless*			*-.13*	-.26*	*-.13*
Rsq:	.47	.50	.51	Adj. Rsq:	.50

* $p < .05$ ** $p < .01$ (two-tailed).

Older males (15-18): N = 624.

[a] Only those variables entered in final block shown.

As seen in the final equation, the interaction terms between measures of low self-control and opportunity prove to be of greatest significance in the reported delinquency for younger girls, particularly the interaction between getting together with friends combined with reported drinking (*b* = .38). Additional interaction effects are reported for mother's supervision and impulsivity (*b* = .25) and father's supervision and carelessness (*b* = .21). The degree to which younger females report smoking is also a strong predictor (*b* = .32), followed by the factor score for risk-seeking (*b* = .22), and the factor score for present-oriented (*b* = .20). The effects for drinking, while substantial in the first block, are non-significant in the final equation when measures of opportunity and interaction terms are introduced. Although the interaction terms and low self-control measures represent more substantial effects, mother's supervision as a measure of opportunity continues to predict a modest increase in general delinquency (*b* = .10). These variables, taken together, explain a very substantial 64% of the variance in the composite delinquency scale for younger females (Adj. Rsq. = .64).

Multiple regression analysis for older females

Inspection of the bivariate correlations for older females, reported in Appendix 2.7, reveals that just as for the total sample and all subsamples previously considered, drinking (r = .48), smoking (r = .48), and the two factor scores for risk-seeking (r = .35) and impulsivity (r = .35), as well as most other measures, have substantial bivariate correlations with the composite delinquency scale. Most measures of opportunity are moderately correlated with one another, and most (except curfew) are correlated with smoking and drinking. Smoking and drinking, as in all previous analyses, reveal a substantial bivariate correlation with one another (r = .53).

Section B of Table 11 reports the results of regressing the composite delinquency scale on predictor variables for older females. The introduction of the first block, containing measures of low self-control and the exogenous variables, identifies the factor score for impulsivity as the strongest effect (*b* = .40), followed by risk-seeking (*b* = .35) and smoking (*b* = .31). The R-square reported for this block is .49. Introduction of measures of opportunity in the second block contributes to a minimal increase in R-square to .50, with the largest coefficient reported for mother's supervision (*b* = .09). The third block containing interaction terms results in the introduction of only one measure, mother's supervision and impulsivity (*b* = .22), and again results in a very slight increase in R-square to .51.

For older females, risk-seeking behaviour is identified as the strongest predictor of delinquency in the final equation (*b* = .29). Smoking and drinking as behavioural indicators of low self-control are also identified as significant predictors, with coefficients of .23 and .17 respectively. As in the previous analyses, mother's supervision as a measure of opportunity predicts a modest increase in general delinquency, but its standardized coefficient (*b* = .09) is substantially smaller than that reported for the interaction between mother's supervision and impulsivity (*b* = .22). The factor score for impulsivity, which appeared to be the strongest effect in the first block, is non-significant when its interaction with opportunity is controlled. The adjusted R-square of .50 indicates that these variables explain about 50% of the variance in the composite scale of general delinquency reported by older females.

Multiple regression analysis for younger males

Bivariate correlations for younger males are reported in Appendix 2.8. The observed bivariate relationships differ very little from those observed for the other age/sex samples and for the sample as a whole, identifying statistically significant correlations for general delinquency with all predictors except the factor score for carelessness and for the exogenous variables of race/Asian and mean neighbourhood income. Consistent with previous patterns, the largest bivariate correlations with delinquency are identified for drinking (r = .44) and smoking (r = .43) and the two personality factors of risk-seeking (r = .43) and impulsivity (r = .44). Smoking and drinking, however, are significantly correlated with fewer of the personality measures of low self-control for younger males than for females of either age group. Both of these behavioural measures are correlated with almost all measures of opportunity, and as in all previous samples thus far have a significant bivariate relationship with one another (r = .34); this correlation, however, is of much smaller magnitude than for females of the same age group (r = .63 for younger females).

Regression results for general delinquency among younger males are reported in Section C of Table 11. The introduction of measures of low self-control and the exogenous variables, in the first block, identifies the factor score for impulsivity as having the largest standardized coefficient (*b* = .44), followed by risk-seeking (*b* = .39) and drinking (*b* = .24). Introduction of this block results in an R-square of .51. The second block, containing measures of opportunity, increases the R-square to .55; the largest coefficient is reported for mother's supervision (*b* = .17). The third block introduces four interaction terms: getting together with friends and impulsivity, driving around and impulsivity, mother's supervision and risk-seeking, and father's supervision and present-oriented, and contributes to a .04 increase in R-square to .59.

In the final equation, the single strongest predictor of delinquency among these younger males is the interaction term for getting together with friends and impulsivity; its unstandardized coefficient of .49 means that for every standard deviation increase in this measure, respondents report almost one-half standard deviation increase in delinquency. And in fact, the effects identified for each of the other interaction terms are more substantial than for any of the measures of low self-control alone, including the behavioural indicators of smoking and drinking. The standardized coefficient for father's supervision and present-oriented is .28, while that for mother's supervision and risk-seeking is .26; these effects are nearly twice as large as those for smoking (.14) and drinking (.13). Impulsivity, which was identified as the strongest effect in the first block, is associated with a negative coefficient when the interaction terms are introduced, indicating that impulsivity alone does not lead to delinquency for these youths. When highly impulsive youths are together with their friends without adult supervision, however, or drive around with friends, it appears that they are highly likely to commit delinquency. These variables account for 58% of the variance in the composite scale of delinquency for younger males.

Multiple regression analysis for older males

Appendix 2.9, which summarizes bivariate correlations for older males, reveals generally the same pattern of bivariate relationships identified for previous samples, with substantial correlations reported for general delinquency with drinking (r = .53), smoking (r = .49), risk-seeking (r = .38) and impulsivity (r = .33). Statistically significant relationships are also identified for delinquency with opportunity measures except for curfew, and opportunity measures tend to be significantly correlated with one another. Smoking and drinking are highly correlated with one another (r = .56), and to a lesser degree with the personality measures of low self-control, risk-seeking and impulsivity.

The regression results for older males are reported in Section D of Table 11. The first block, containing measures of low self-control and exogenous variables, identifies smoking as the largest coefficient (b = .49), followed by the regression factors scores for impulsivity and risk-seeking (b = .29 for both). The R-square for this initial block is .47. Among the second block of variables, mother's supervision is again the strongest measure of opportunity (b = .14). Introduction of the interaction terms, in the third block, results in the entry of the interaction between curfew and present-oriented, and driving around with friends and carelessness; both are associated with negative coefficients.

For older males, the most substantial and statistically significant predictors of delinquency in this analysis are the measures of low self-control. While the strongest effects are identified for the preference for risk-seeking (b = .24) and carelessness (b = .24), impulsivity (b = .21), smoking (b = .23) and drinking (b = .17) are also associated with modest increases in the composite scale of delinquency. The interaction between low self-control and opportunity, for older males, is of little importance; in fact, the two interaction terms retained in the final equation are reported to have negative coefficients. These findings are consistent with the expectation that for older males, more than for any other group, opportunities are widespread and virtually omnipresent. For older males, the variables included explain about 50% of the variance in their reported delinquency as measured by the composite scale.

Hypotheses for general delinquency by gender and age. In terms of the overall pattern of effects identified, the results of the series of analyses for younger and older males and females have been consistent with those previously identified, both for the total sample, for the sample split on age, and for the sample split on gender. At each stage of the analysis the indicators of low self-control, including one of the personality factors scores (particularly a preference for risk-seeking), and one or both of the behavioural measures of smoking and drinking, have been identified as statistically significant predictors of the likelihood of delinquency. Thus for hypothesis one, which had stated that measures of low self-control would significantly predict delinquency, there is justification for failing to accept the null hypothesis. Hypothesis two had claimed that measures of low self-control in combination with opportunity would also predict delinquency, a statement that leads to the expectation that one or more interaction terms would have a statistically significant, positive effect. For both younger males and females, and for older females, this expectation is met. For older males, however, the interaction between low self-control and opportunity is negligible; the two interaction terms are associated with small but significant negative effects. Thus hypothesis two is supported for all groups except for older males.

Comparison of gender and age samples. The two additional hypotheses derived from General Theory that have been considered up to this point (H3 and H4) dealt with a comparison of age groups, discussed in Chapter 4, and of males and females, discussed earlier in this chapter. Both of these hypotheses stated that when the sample was divided into groups on the basis of one of these criteria, thereby controlling for assumed differences, the effects of low self-control would be similar. While some variations were noted in each analysis, with different specific measures of low self-control identified as the strongest predictors, the overall patterns consisting of low self-control and its interactions with opportunity as predictors of delinquency were similar enough to support these hypotheses.

In the current analysis of age/gender groups, the significance of these relative differences in the measures of low self-control have diminished. Differences in the strength of psychological predictors for males and females persist somewhat; but this is not theoretically inconsistent. As noted previously, General Theory asserts that personality manifestations of low self-control are multidimensional. It might be concluded, therefore, that males and females express low self-control differently, in terms of personality traits, as a consequence of differential socialization. Moreover, apparent discrepancies largely disappear when gender is controlled. Although the unstandardized coefficient for smoking for younger females seems larger than that for older females (1.20 vs. .66), the difference is not large enough to be significant ($t = 1.78$, $p > .05$). Nor are differences for younger vs. older males, or for that matter younger females vs. younger males, or even for the most divergent groups of younger females vs. older males.

The division of the sample into age/gender groups, however, underscores the role that opportunity plays in the commission of delinquency, and provides a basis for interpreting the significance of interactions between low self-control and opportunity for different groups. As seen from the previously-discussed means, younger teens of both sexes are more closely supervised than their older peers; and thus in the regression results for age/sex groups, the interaction terms are of greater magnitude for these younger teens. In fact, for both younger females and younger males, the relative effects of the interactions between low self-control and opportunity overshadow the effects of low self-control alone. For older females, the somewhat greater freedom from supervision they experience in comparison to younger females means that their opportunities are greater, and measures of low self-control provide a stronger indication of the likelihood of their being delinquent. For older males, however, the interaction between low self-control is not a necessary condition for increased delinquency; the extent to which these youths are delinquent is predicted largely by the measures of self-control.

These results suggest, then, that there is an interaction between age and sex. Yet this effect is important primarily in the context of opportunity, so that for teens in each group, low self-control is translated into delinquent behaviour in a very consistent manner when other factors are controlled, a finding that is supportive of General Theory.

CHAPTER 6

SELF-CONTROL, OPPORTUNITY, AND THE VERSATILITY OF EFFECTS

The final objective of this research was to determine whether the causal factors identified by General Theory provided an explanation for the commission of different *types* of delinquency, and if so whether the effects were similar. With this in mind, the composite scale of general delinquency was assessed for the construction of three different subscales, as detailed in Chapter 3: property offences, drug offences, and violent or personal offences. These subscales were then used as the dependent variables in a series of regression analyses, discussed below.

The youths who commit these various types of delinquency, however, are not mutually exclusive samples of teens. On the contrary, the youths who commit crimes in one category of offence are the same ones most likely to commit those in another. This is readily apparent from the fact that the general delinquency scale has a high inter-item reliability, representing internal consistency in the specific items, and that its reliability is high for all groups. Youths who commit property offences are also the same youths who are *more likely* to commit violent offences; otherwise, these items would not cohere together to form an adequate index of delinquency. Moreover, there is almost complete overlap in item content between general delinquency and the three subscales; general delinquency *consists* of property, drug, and violent offences combined. With these points in mind, the discussion below focuses less on the specific details of each analysis, which in most respects replicate findings more exhaustively considered in the preceding two chapters. Instead, the discussion centres primarily on the comparison of different types of offending.

PROPERTY OFFENCES

Property offences of one type or another comprise about half of the items included in the general delinquency scale. The prominence of this type of offending among these subjects is apparent from the bivariate correlations between the property subscale and general delinquency, which exceeds .90 both for the total sample and for all subsamples (Appendix 2.1 - 2.9). For some subjects, particularly females and younger teens, commission of property crimes dominates to such an extent that this is the only type of crime with sufficient inter-item reliability to form a subscale. It might therefore be concluded that for these groups, causal factors identified for property offences will be nearly identical to those for general delinquency, both in magnitude and in relative ordering of importance. Older teens, however, particularly males, also reported committing violent and/or drug offences with sufficient frequency and regularity so that reliable subscales could be constructed for these categories. For these youths, property offences represent a more restricted measure of their offending (albeit still a large proportion) and thus the role played by various predictors may differ. However, General Theory asserts that *all* crimes are caused by an underlying lack of self-control, although specific patterns of offence are shaped by circumstances and opportunity. In light of this, any apparent differences can be expected to occur primarily with respect to this latter element of opportunity, as discussed in Chapter 2.

Property offences for the total sample. The results of regressing property offences on measures of low self-control and opportunity for the total sample are summarized in Table 12. The strongest predictors of this type of offending are identified as the factor score for risk-seeking behaviour (b = .25), followed by drinking (b = .17), and the interaction between mother's supervision and impulsivity (b = .15). Smoking and the factor score for carelessness (b = .13 for each), in addition, have a modest, statistically significant effect. Overall, measures of low self-control alone are the strongest predictors of the likelihood of committing property offences for these teens, as seen not only from the magnitude of effects but the fact that almost all of the indicators of this underlying construct are statistically significant. Impulsivity is the sole exception; while in the first block of the equation this measure is associated with a relatively large effect, in the final results its effects are negligible, an outcome that may be attributed to impulsivity's being a component of the two statistically significant interaction terms.

In spite of several minor differences, these results are very similar to those obtained for general delinquency among the total sample, reported in Table 6, both in the general ordering of variables and in their magnitude. The analysis for general delinquency had identified measures of low self-control, particularly risk-seeking, smoking, and drinking, as the strongest predictors, followed by the interaction between mother's supervision and impulsivity. Although for the more restricted scale of property offences the interaction between low self-control is slightly more prominent, as seen in the inclusion of an additional statistically significant interaction term (driving around with friends and impulsivity), in both analyses measures of low self-control are associated with the greatest increase in the dependent variable.

TABLE 12
Regression of property offences on self-control and opportunity for total sample

Block summary and coefficients from multiple regression analysis

	Property offences				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.34*			.08	*.02*
Risk-seeking	*.38*			1.00**	*.25*
Temper	*.13*			.41**	*.10*
Carelessness	*.19*			.51**	*.13*
Present-oriented	*.07*			.21**	*.05*
Smoking	*.24*			.32**	*.13*
Drinking	*.21*			.55**	*.17*
Sex	*.09*			.70**	*.09*
Age	*.16*			-.05	*-.03*
Race/Asian	*-.09*			-.13	*-.01*
Race/Aboriginal	*.05*			.26	*.02*
Neighbourhd. Income	*-.01*			.05	*.02*
Mother's supervision		*.10*		.23**	*.09*
Father's supervision		*.07*		.09*	*.05*
Curfew		*.03*		.01	*.00*
Together w/friends		*.04*		.07	*.02*
Drive around		*.07*		.17**	*.06*
*Mother's super*impuls*			*.17*	.18**	*.15*
*Drive*impulsivity*			*.08*	.13*	*.08*
Rsq.:	.43	.44	.45	Adj. Rsq:	.45

* $p < .05$ ** $p < .01$ (two-tailed)

N = 2095.

[a] Only variables entered in final block shown.

Property offences and age. Regression results for property offences by age group are reported in Table 13. For younger teens, smoking as a behavioural indicator of low self-control is associated with the greatest increase in the likelihood of this type of offence (*b* = .37, reported in section A of Table 13). Aside from the substantial effects associated with this measure, the only other measure of low self-control that is identified as being statistically significant is the factor score for carelessness. Its relatively modest effects (*b* = .09), however, are overshadowed by the effects identified for the interaction terms, particularly for driving around with friends and impulsivity (*b* = .27), and mother's supervision and present-oriented (*b* = .26). These findings suggest that the interaction between low self-control and opportunity is of much greater importance than low self-control by itself in predicting property offences for younger teens, a finding that may be attributable to the greater general supervision these youths are assumed to experience and the consequent reduction in opportunity.

For older teens, on the other hand, the likelihood of committing property crimes is associated primarily with measures of low self-control alone (section B of Table 13). The degree to which respondents report a preference for risk-seeking behaviour predicts a substantial increase in this type of offending (*b* =.25); more moderate increases are also predicted by drinking behaviour (*b* = .15), carelessness (*b* = .14), and smoking (*b* = .13). Two measures of opportunity (mother's supervision and driving around with friends) are identified as statistically significant, but the effects identified for them are relatively small; and the single interaction term included in the final results is non-significant.

For both younger and older teens, these results closely parallel those identified for general delinquency (Table 7 and 8). For younger teens, the factor score for risk-seeking behaviour was identified as a significant predictor of general delinquency, whereas for the more restricted category of property offences its effects are less prominent. Aside from this difference, however, essentially the same pattern emerges in terms of the relative weight of causal factors. Smoking as a behavioural indicator of low self-control is strongly associated with delinquency among younger teens, both in the analysis for general delinquency and for property offences. Similarly, results for general delinquency had identified the interaction between opportunity and low self-control as more important than low self-control alone for younger teens, compared to the total sample or for older teens. Here, too, the results for property offences are similar, as seen from both the number of interaction terms identified as significant, and in the overall magnitude of their effects.

TABLE 13
Regression of property offences on self-control and opportunity by age

Block summary and coefficients from multiple regression analysis

A. YOUNGER TEENS

	Property offences				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.32*			-.13	*-.04*
Risk-seeking	*.40*			.32	*.08*
Temper	*.18*			-.11	*-.03*
Carelessness	*.13*			.31**	*.09*
Present-oriented	*.16*			-.13	*-.04*
Smoking	*.17*			1.05**	*.37*
Drinking	*.30*			.09	*.02*
Sex	*.08*			.22	*.03*
Age	*.18*			.15	*.04*
Race/Asian	*-.04*			.37	*.04*
Race/Aboriginal	*.16*			.80**	*.07*
Neighbourhd. Income	*-.09*			.08	*.03*
Mother's supervision		*.14*		.32**	*.12*
Father's supervision		*.06*		.09	*.06*
Curfew		*.04*		.05	*.02*
Together w/friends		*.06*		.16*	*.06*
Drive around		*.08*		.16	*.05*
Drive impuls.*			*.22*	.52**	*.27*
*Drive*present-oriented*			*-.12*	-.26**	*-.13*
*Father's super*drink*			*.18*	.11*	*.18*
*Father's super*temper*			*.13*	.11**	*.16*
*Mother's super*risk*			*.15*	.17*	*.18*
*Father's super*smoke*			*-.15*	-.11**	*-.24*
*Mother's super*present*			*.27*	.28**	*.26*
Rsq. (Adj):	.49	.51	.55	Adj. Rsq:	.53

* p < .05 ** p < .01 (two-tailed)

Younger teens (11-14) N = 770.

[a] Only those variables entered in final block shown.

B. OLDER TEENS

	Property offences				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.26*			.42	*.10*
Risk-seeking	*.30*			1.02**	*.25*
Temper	*.08*			.41**	*.10*
Carelessness	*.18*			.56**	*.14*
Present-oriented	*.02*			.14	*.03*
Smoking	*.35*			.31**	*.13*
Drinking	*.18*			.48**	*.15*
Sex	*.25*			1.07**	*.13*
Age	*-.05*			-.29**	*-.07*
Race/Asian	*-.07*			-.49*	*-.04*
Race/Aboriginal	*.00*			-.09	*-.01*
Neighbourhd. Income	*.01*			.01	*.00*
Mother's supervision		*.10*		.20**	*.08*
Father's supervision		*.04*		.07	*.04*
Curfew		*.03*		.02	*.01*
Together w/friends		*.03*		.01	*.00*
Drive around		*.07*		.20**	*.06*
*Mother's super*impuls*			*.14*	.16	*.13*
Rsq. (Adj):	.41	.42	.42	Adj. Rsq:	.41

* p < .05 ** p < .01 (two-tailed)

Older teens (15-18) N = 1325.

[a] Only those variables entered in final block shown.

Earlier results for general delinquency among older teens had identified measures of low self-control, particularly risk-seeking behaviour, drinking and carelessness, as the strongest predictors -- a pattern of effects that is virtually identical to the results for property crimes. The analysis for general delinquency, however, had also identified the interaction between low self-control and opportunity as contributing to the increased likelihood of offending, reporting statistically significant effects for three interaction terms. For property offences, by contrast, none of the interaction measures is significant. These findings would suggest that opportunities for property crime, at least the ones addressed in this scale, are relatively widespread for older youths. The extent to which such offences occur appears to be dictated largely by the activities and inclinations of these youths themselves -- in particular, by the degree to which they lack low self-control as measured by several indicators of this concept.

Property offences and gender. Results obtained from regressing the scale of property offences on predictors for females and for males are reported in Table 14. For females (section A), the strongest predictors are drinking (b = .27) and the factor score for risk-seeking (b = .24). In addition, three interaction terms are identified as contributing to an increase in the likelihood of property crime; in fact, the standardized coefficient for one of these terms, for mother's supervision and impulsivity (b = .18), is larger in magnitude than most of the other statistically significant effects, except for drinking and risk-seeking. This pattern contrasts with that identified for males (section B), where each of the seven indicators of low self-control is identified as a significant predictor of property crime, and none of the measures of the interaction between low self-control and opportunity are included. For males the most important predictors are the factors scores for impulsivity (b = .24) and risk-seeking (b = .23), followed by drinking and smoking (b = .16 and b = .14, respectively).

As in the results for the sample split on age, discussed above, these findings conform closely to those identified for general delinquency for each sex, both in the ordering and magnitude of predictors. The analysis reported in Chapter 5 had identified risk-seeking as the strongest predictor of general delinquency for females (Table 10, section A), with drinking, smoking, and the interaction between mother's supervision and impulsivity associated with additional significant effects; this overall pattern is reproduced for property offences. Thus, the analyses for both general delinquency and property offences identify measures of low self-control as important in female offending, but also underscore the importance of the interaction between low self-control and opportunity. This finding is consistent with the assumption that females are more closely supervised by parents than males, and therefore may be expected to have lesser opportunities for deviance.

TABLE 14

Regression of property offences on self-control and opportunity by sex

Block summary and coefficients from multiple regression analysis

A. FEMALES

	Property offences				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.35*			-.02	*-.01*
Risk-seeking	*.40*			.93**	*.24*
Temper	*.17*			.45**	*.13*
Carelessness	*.17*			.44**	*.13*
Present-oriented	*.10*			.25**	*.07*
Smoking	*.23*			.26**	*.13*
Drinking	*.21*			.80**	*.27*
Age	*.03*			-.10*	*-.06*
Race/Asian	*-.07*			-.06	*-.01*
Race/Aboriginal	*.07*			.68*	*.05*
Neighbourhd. Income	*-.04*			.01	*.00*
Mother's supervision		*.08*		.16*	*.07*
Father's supervision		*.02*		.03	*.02*
Curfew		*.03*		.19**	*.09*
Together w/friends		*.02*		-.02	*-.01*
Drive around		*.06*		.15*	*.05*
*Curfew*impulsivity*			*.07*	.17**	*.10*
*Curfew*drink*			*-.10*	-.13*	*-.12*
*Mother's super*impuls*			*.22*	.19**	*.18*
Curfew risk*			*.07*	.13**	*.07*
Rsq:	.42	.43	.45	Adj. Rsq:	.44

* $p < .05$ ** $p < .01$ (two-tailed)

Females N = 1134.

[a] Only variables entered in final block shown.

B. MALES

	Property offences				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.32*			1.05**	*.24*
Risk-seeking	*.28*			.89**	*.23*
Temper	*.09*			.34**	*.08*
Carelessness	*.12*			.57**	*.13*
Present-oriented	*.05*			.17*	*.04*
Smoking	*.42*			.38**	*.14*
Drinking	*.20*			.51**	*.16*
Age	*.09*			.01	*.01*
Race/Asian	*-.07*			-.16	*-.00*
Race/Aboriginal	*.00*			-.10	*-.01*
Neighbourhd. Income	*.02*			.07	*.03*
Mother's supervision		*.12*		.29**	*.10*
Father's supervision		*.07*		.14*	*.07*
Curfew		*.02*		-.01	*-.00*
Together w/friends		*.07*		.21	*.05*
Drive around		*.06*		.20*	*.06*
Rsq:	.40	.43	(.43)	Adj. Rsq:	.42

* p < .05 ** p < .01 (two-tailed)

Males N = 961.

[a] Only variables entered in final block shown.

For males (section B of Table 10) the likelihood of general delinquency was substantially predicted by measures of low self-control, particularly by the factor score for impulsivity and the behavioural measures of smoking and drinking, again parallelling the findings for property offences. An additional factor for general delinquency among males, however, was the interaction between low self-control and opportunity, as measured by the term for getting together with friends and risk-seeking. For the more restricted scale of property offences, by contrast, this element is seen to be of lesser importance. It might be concluded that for males, who are assumed to have greater freedom from supervision, opportunities are relatively widespread; the extent to which property crimes are committed seems to be largely a function of low self-control. This observation, in turn, parallels the findings described above for property offences among younger vs. older teens: for older teens, as for males, interactions between low self-control and opportunity are important elements in the commission of *general* delinquency, but are not significant for the narrower category of property offences. It might thus be predicted that the significant effects of the interaction between low self-control and opportunity, which shows up in the results for general delinquency but is missing in the analysis for property offences, may be important for the occurrence of *other* offences, ones that form part of the general delinquency scale but that are omitted from the property scale -- drug offences, or violent offences, both of which are discussed in the following sections.

Property offences by gender and age. The final series of analyses for the scale of property offences, based on both age and gender, are summarized in Tables 15 and 16. For younger females (Table 15, section A), the interaction terms between various measures of low self-control and opportunity are in general the most significant predictors for this type of offending. Getting together with friends and carelessness (b = .25), driving around and impulsivity (b = .23), and mother's supervision and present-oriented (b = .23) all predict substantial and statistically significant increases in the dependent variable; additional more modest effects are identified for two other interaction terms. Measures of low self-control alone are also associated with the increased likelihood of committing property offences, particularly risk-seeking (b = .21), smoking (b = .17), and drinking (b = .25); but except for the last of these, the magnitude of their effects is smaller than those identified for several of the interaction terms.

For older females, by contrast (section B), more substantial effects are identified for measures of low self-control. All indicators of this concept except impulsivity are statistically significant, with the largest effects associated with risk-seeking (b = .29) and drinking (b = .16). While impulsivity appears to be a strong predictor in the first block of variables, containing only measures of low self-control and the exogenous variables, its effects are non-significant when its interaction with mother's supervision is introduced in the final block (b = .21 for the interaction term).

TABLE 15
Regression of property offences on self-control and opportunity for females by age

Block summary and coefficients from multiple regression analysis

A. YOUNGER FEMALES

	Property offences				
	(1)	*(2)*	*(3)* [a]	*(4)* B	*b*
Impulsivity	*.35*			-.07	*-.02*
Risk-seeking	*.40*			.79**	*.21*
Temper	*.18*			-.34	*-.11*
Carelessness	*.19*			-.39	*-.13*
Present-oriented	*.12*			-.43	*-.13*
Smoking	*.32*			.42**	*.17*
Drinking	*.30*			.81**	*.25*
Age	*.14*			.00	*.00*
Race/Asian	*.00*			.19	*.02*
Race/Aboriginal	*.19*			1.10**	*.09*
Neighbourhd. Income	*-.09*			.10	*.05*
Mother's supervision		*.09*		.25	*.09*
Father's supervision		*.05*		.05	*.03*
Curfew		*.03*		.04	*.02*
Together w/friends		*.05*		.15	*.06*
Drive around		*.11*		.34**	*.10*
*Curfew*temper*			*.12*	.19*	*.11*
*Together*careless*			*.24*	.20*	*.25*
*Drive*impuls.*			*.21*	.40**	*.23*
*Mother super*present*			*.23*	.26*	*.23*
*Father super*temper*			*.15*	.10	*.15*
Rsq:	.54	.56	.59	Adj. Rsq:	.58

* $p < .05$ ** $p < .01$ (two-tailed)

Younger females (11-14): N = 433

[a] Only variables entered in final block shown.

B. OLDER FEMALES

	Property offences				
	(1)	*(2)*	*(3)*[a]	*(4)* B	*b*
Impulsivity	*.37*			.23	*.07*
Risk-seeking	*.33*			1.17**	*.29*
Temper	*.17*			.51**	*.14*
Carelessness	*.16*			.47**	*.13*
Present-oriented	*.09*			.27*	*.08*
Smoking	*.20*			.23**	*.12*
Drinking	*.17*			.48**	*.16*
Age	*-.05*			-.26*	*-.08*
Race/Asian	*-.12*			-.41	*-.04*
Race/Aboriginal	*.05*			.48	*.03*
Neighbourhd. Income	*-.01*			-.04	*-.02*
Mother's supervision		*.07*		.15*	*.07*
Father's supervision		*.00*		.01	*.01*
Curfew		*.04*		.05	*.02*
Together w/friends		*-.02*		-.12	*-.04*
Drive around		*.06*		.14	*.05*
*Mother's super*impuls*			*.21*	.22**	*.21*
Rsq:	.38	.39	.40	Adj. Rsq:	.39

* p < .05   ** p < .01 (two-tailed)

Older females (15-18): N = 701.

[a] Only variables entered in final block shown.

Results of regressing property offences on independent variables for younger males, reported in section A of Table 16, again identify the interaction between low self-control and opportunity as being highly significant for this type of offending. The standardized coefficients for getting together with friends and smoking (*b* = .42), mother's supervision and risk-seeking (*b* = .39), mother's supervision and present-oriented (*b* = .35), and driving around with friends and impulsivity (*b* = .30) are all substantial and statistically significant, and are far greater in magnitude than the effects identified for measures of low self-control alone. While important effects were reported for smoking and for the factors scores for impulsivity and risk-seeking when these measures were introduced in the first block, their effects are minimal and nonsignificant when their interaction with measures of opportunity are controlled, in the final results.

For older males, on the other hand, the results from regressing property offences on predictor variables (Table 16, section B) again emphasize the central role played by measures of low self-control. The factor scores for impulsivity (*b* = .25), risk-seeking (*b* = .25), and carelessness (*b* = .15) all predict a substantial and statistically significant increase in the dependent variable, as do the behavioural measures of smoking and drinking (*b* = .15 for each). And in fact, these indicators of low self-control account for virtually all of the explained variance for this type of offending by older males; very few of the other measures are significant, aside from the modest direct effects associated with two of the opportunity measures.

As in the other analyses for property offences, these results for younger and older males are very similar to those identified for general delinquency. For younger males (section C of Table 11), general delinquency was predicted by measures of low self-control, including smoking, drinking, and the factor scores for temper and carelessness; but larger effects were identified for measures of the interaction between low self-control and opportunity -- a pattern highly similar to the results for property offences. For older males, on the other hand (section D of Table 11), increases in the likelihood of general delinquency were associated almost exclusively with increases in measures of low self-control, particularly impulsivity, carelessness, and the preference for risk-seeking, along with smoking and drinking. Again, these results are nearly identical to those identified for property offences. While for both groups some slight differences in the order and magnitude of effects are apparent, they are at best minimal.

TABLE 16
Regression of property offences on self-control and opportunity for males by age

Block summary and coefficients from multiple regression analysis

A. YOUNGER MALES

	Property offences				
	(1)	*(2)*	*(3)* [a]	*(4)* *B*	*b*
Impulsivity	*.37*			-.08	*-.02*
Risk-seeking	*.36*			-.27	*-.08*
Temper	*.14*			.42**	*.12*
Carelessness	*.17*			.35*	*.10*
Present-oriented	*.17*			-.13	*.04*
Smoking	*.16*			-.97	*-.27*
Drinking	*.23*			.38*	*.10*
Age	*.16*			.32*	*.08*
Race/Asian	*-.01*			.52	*.06*
Race/Aboriginal	*.08*			.67	*.06*
Neighbourhd. Income	*-.08*			.09	*.04*
Mother's supervision		*.18*		.38	*.14*
Father's supervision		*.11*		.13	*.01*
Curfew		*.04*		.01	*-.01*
Together w/friends		*.08*		.19	*.06*
Drive around		*.03*		.07	*.02*
*Mother's super*risk*			*.32*	.35**	*.39*
*Drive*impuls*			*.23*	.62**	*.30*
*Drive*present*			*-.20*	-.41**	*-.20*
*Together*smoke*			*.42*	.34*	*.42*
*Mother's super*present*			*.33*	.38**	*.35*
Rsq:	.44	.48	.54	Adj. Rsq:	.51

* p < .05 ** p < .01 (two-tailed)

Younger males (11-14): N = 337.

[a] Only variables entered in final block shown.

B. OLDER MALES

	Property offences				
	(1)	*(2)*	*(3)*[a]	*(4)* B	b
Impulsivity	*.29*			1.06**	*.23*
Risk-seeking	*.27*			.91**	*.23*
Temper	*.07*			.28*	*.06*
Carelessness	*.16*			.63**	*.15*
Present-oriented	*.01*			-.01	*.00*
Smoking	*.38*			.38**	*.15*
Drinking	*.19*			.48**	*.15*
Age	*-.03*			-.36*	*-.08*
Race/Asian	*-.10*			-.48	*-.04*
Race/Aboriginal	*-.03*			-.54	*-.03*
Neighbourhd. Income	*.03*			.03	*.01*
Mother's supervision		*.11*		.25*	*.09*
Father's supervision		*.06*		.13	*.06*
Curfew		*.03*		.00	*.00*
Together w/friends		*.07*		.19	*.04*
Drive around		*.08*		.26*	*.08*
Rsq:	.36	.39		Adj. Rsq:	.37

* p < .05 ** p < .01 (two-tailed)

Older males (15-18): N = 624.

[a] No variables entered in Block 3.

These findings, moreover, lend further weight to the observations made above regarding the results obtained for younger and older teens, and males and females of all ages. For those teens assumed to be more closely supervised -- females and younger teens of both sexes -- the degree to which low self-control leads to the commission of property offences (or delinquency more generally) -- is highly contingent on its interaction with opportunity. The low self-control youth who is closely monitored by parents may commit some offences, but not many, in comparison to the low self-control teen who is relatively unsupervised. For the least-supervised groups -- older teens and males -- the role played by the interaction between low self-control and opportunity is generally minimal. For these teens, it would appear, opportunities abound, particularly for property crime; and the extent to which such offences are committed is dictated almost entirely by these youths' low self-control.

DRUG OFFENCES

Four of the questions that formed part of the general delinquency index dealt specifically with the use or sale of drugs; and these items, as reported in Chapter 3, were combined into a scale for drug offences. Items within this category were too infrequent and sporadic in their occurrence to form a reliable subscale for all respondents. Where the scale was reliable, however (for the total sample, older teens, and males of both age groups), drug offences were used as the dependent variable in a series of analyses, reported below.

In contrast to opportunities for property crime, which are widespread enough so that virtually any youth with the inclination to do so can commit at least a few such offences, drug offences are assumed to be particularly dependent upon circumstances of opportunity. A significant proportion of this opportunity has to do with the simple availability of drugs; additionally, however, it may involve association with other youths, since drug use is closely linked with peer relationships (Elliott et al 1985, 1988). Thus drug use was predicted to be specifically linked to the interaction between low self-control and opportunity, and causal patterns identified were expected to differ somewhat from results identified for both general delinquency and property crime.

Drug offences for the total sample. Results of regressing drug offences on measures of low self-control and opportunity, for all respondents, are summarized in section A of Table 17. While most measures of low self-control appear to be highly predictive of this type of offending when these factors are considered alone, in the first block, they are relatively weak and nonsignificant in the final results. Instead, almost all of the statistically-significant effects are associated with measures of the interaction between low self-control and opportunity. The strongest predictor is getting together with friends and drinking ($b = .42$), which predicts a very substantial .4 standard deviation increase in the occurrence of drug offences when other variables in the equation are controlled. Additional significant effects are identified for father's supervision and drinking (*b* = .19), mother's supervision and smoking (*b* = .15), curfew and smoking (*b* = .12) and four interactions between driving around with friends and various measures of low self-control. None of the measures of direct supervision, and only one of the measures of low self-control alone (present-oriented), are statistically significant. Five additional interaction measures are reported as having negative coefficients, a result that can be attributed to their high correlations with other, stronger effects.

Comparing these results to those reported for general delinquency and property offences for the total sample reveals that they are very different, although not in unexpected ways, and not in ways that contradict predictions derived from General Theory. Increases in the likelihood of general delinquency were predicted primarily by measures of low self-control, particularly risk-seeking, smoking, and drinking, with an additional increase predicted by the interaction between mother's supervision and impulsivity. The occurrence of property offences, similarly, was in general associated with the same measures of low self-control, and the same interaction term. Drug offences, in contrast, are predicted almost entirely by multiple measures of the interaction between low self-control and opportunity.

One noteworthy feature of the results for drug offences has to do with the interaction terms -- not only their number and magnitude, but the specific opportunity measures that contribute to them. Driving around with friends was a statistically significant but very weak direct predictor of general delinquency and of property crimes for the total sample. As a component of interactions between low self-control and opportunity, it contributed to a similarly weak increase in the likelihood of property crimes (but not general delinquency). For drug offences, however, this measure of opportunity provides the basis for five of the statistically-significant interaction effects. Similarly, getting together with friends predicted a very small direct increase in general delinquency for the total sample, but was non-significant for property offences and as the opportunity element in interaction terms. Yet in the analysis of drug offences, this element of opportunity contributes to the strong effects identified for the largest measure of interaction. In contrast to the other indicators of opportunity, which dealt with aspects of parental supervision and monitoring, these two measures (getting together with friends and driving around with friends) dealt more specifically with the opportunities afforded by hanging out with peers, with no adult supervision. It appears, therefore, that the interaction between low self-control and opportunity is of critical importance in the occurrence of drug offences; and moreover that the *nature* of that opportunity is significant, with unsupervised association with peers playing a particularly prominent role.

TABLE 17
Regression of drug offences on self-control measures for total sample and older teens

Block summary and coefficients from multiple regression analysis

A. TOTAL SAMPLE

	Drug offences				
	(1)	*(2)*	*(3)*^{a}	*(4) B*	*b*
Impulsivity	*.18*			-.03	*-.02*
Risk-seeking	*.27*			.02	*.01*
Temper	*.05*			.09	*.06*
Carelessness	*.11*			.04	*.03*
Present-oriented	*.01*			.10*	*.07*
Smoking	*.51*			.06	*.07*
Drinking	*.23*			-.15	*-.14*
Sex	*-.03*			.01	*.00*
Age	*.28*			.06**	*.08*
Race/Asian	*-.15*			-.17**	*-.05*
Race/Aboriginal	*.04*			-.03	*-.00*
Neighbourhd. Income	*-.03*			.00	*.00*
Mother's supervision		*.05*		.00	*.00*
Father's supervision		*.05*		-.00	*-.00*
Curfew		*.01*		-.01	*-.01*
Together w/friends		*.04*		-.00	*-.00*
Drive around		*-.01*		.00	*-.00*
*Curfew*careless*			*-.06*	-.04*	*-.06*
*Curfew*smoke*			*.08*	.04**	*.12*
*Curfew*drink*			*-.07*	-.03*	*-.07*
*Together*drink*			*.47*	.10**	*.42*
*Drive*risky*			*.11*	.06**	*.12*
*Drive*impulsive*			*.07*	.05**	*.09*
*Drive*careless*			*.07*	.04*	*.07*
*Drive*smoke*			*.15*	.04**	*.14*
*Drive*drink*			*-.11*	-.07**	*-.19*
*Mother's super*smoke*			*.22*	.03**	*.15*
*Father's super*temper*			*-.09*	-.02*	*-.09*
*Father's super*present*			*-.10*	-.03**	*-.11*
*Father's super*drink*			*.18*	.04**	*.19*
Rsq.	.46	.47	.51	Adj. Rsq:	.50

Total sample N = 2095.

B. OLDER TEENS

	Drug offences				
	(1)	*(2)*	*(3)*[a]	*(4)* B	*b*
Impulsivity	.11			-.02	-.01
Risk-seeking	.20			.14**	.09
Temper	-.03			.13	.08
Carelessness	.09			.22**	.14
Present-oriented	-.03			.12**	.08
Smoking	.59			.04	.05
Drinking	.22			-.06	-.05
Sex	.08			-.02	-.01
Age	.05			.04	.02
Race/Asian	-.10			-.23**	-.06
Race/Aboriginal	.01			.04	.01
Neighbourhd. Income	-.02			-.01	-.01
Mother's supervision		.05		-.02	-.02
Father's supervision		.07		.01	.01
Curfew		.02		.01	.01
Together w/friends		.07		.01	.01
Drive around		-.03		.01	.01
*Curfew*risk*			.08	.05*	.07
*Curfew*careless*			-.10	-.06**	-.10
*Curfew*smoke*			.10	.04**	.13
*Curfew*drink*			-.11	-.05**	-.13
*Together*drink*			.34	.11**	.41
*Drive*impulsivity*			.09	.06*	.09
*Drive*smoke*			.15	.04*	.15
*Drive*drink*			-.13	-.08**	-.23
*Mother's super*smoke*			.22	.03**	.17
*Father's super*temper*			-.11	-.04*	-.12
*Father's super*present*			-.11	-.03*	-.11
*Father's super*drink*			.14	.03**	.17
Rsq.	.46	.47	.50	Adj. Rsq:	.49

* p < .05 ** p < .01 (two-tailed)

Older teens (15-18) N = 1325.

[a] Only variables entered in final block shown.

Drug offences for older teens. The results obtained from regressing drug offences on predictors for older teens are reported in section B of Table 17. As in the previous analysis for the total sample, the strongest effects are associated with measures of the interaction between low self-control and opportunity, with the largest standardized coefficients identified for getting together with friends and drinking (*b* = .41), father's supervision and drinking (*b* = .17), mother's supervision and smoking (*b* = .17), and four additional measures of interaction. Negative coefficients, again, are reported for five interaction measures (the same ones as reported in the analysis for the total sample, above). For older teens, however, additional increases in the scale of drug offences are predicted by three of the psychological indicators of low self-control: carelessness (*b* = .14), risk-seeking (*b* = .09), and present-oriented (*b* = .08), although the magnitude of their effects is substantially smaller than observed for most of the interaction terms.

These findings for drug offences committed by older teens differ from those previously identified for general delinquency and property offences among this group, in ways that parallel the observations made concerning the total sample (above). The likelihood of general delinquency among older teens was predicted primarily by measures of low self-control alone, especially the factor scores for risk-seeking and carelessness and the behavioural measure of drinking. Interactions between low self-control and opportunity, while significant, were associated with much smaller increases in the dependent variable. Property offences, on the other hand, were predicted almost entirely by indicators of low self-control, with the same measures identified as the strongest predictors. By contrast, drug offences committed by older teens, as for the total sample discussed above, are highly contingent on the interaction between low self-control and opportunity. While low self-control by itself predicts some increase in the likelihood of this type of offending, far more substantial increases are predicted to occur when low self-control youths encounter opportunities as measured by several indicators -- particularly those involving their association with other youths.

TABLE 18
Regression of drug use on self-control and opportunity measures for males

Block summary and coefficients from multiple regression analysis

	Drug use				
	(1)	*(2)*	*(3)*[a]	*(4)* *B*	*b*
Impulsivity	*.08*			.06	*.04*
Risk-seeking	*.15*			-.39**	*-.29*
Temper	*.01*			-.01	*-.01*
Carelessness	*.05*			.07*	*.05*
Present-oriented	*-.03*			.08	*.06*
Smoking	*.64*			.19**	*.22*
Drinking	*.21*			-.16	*-.15*
Age	*.14*			.07**	*.08*
Race/Asian	*-.09*			-.21*	*-.06*
Race/Aboriginal	*-.04*			-.17	*-.03*
Neighbourhd. Income	*.01*			.01	*.01*
Mother's supervision		*.05*		.03	*.00*
Father's supervision		*.05*		.00	*.00*
Curfew		*.03*		-.02	*-.02*
Together w/friends		*.05*		.00	*.00*
Drive around		*.01*		-.01	*-.01*
*Curfew*smoke*			*.09*	.03*	*.08*
*Together*risk*			*.48*	.10**	*.33*
*Together*drink*			*.28*	.08*	*.34*
*Drive*risk*			*.11*	.05*	*.11*
*Drive*present*			*-.11*	-.06*	*-.10*
*Drive*smoke*			*.16*	.05**	*.19*
*Drive*drink*			*-.16*	-.05*	*-.17*
*Father super*drink*			*.23*	.03*	*.17*
Rsq:	.50	.51	.54	Adj. Rsq:	.53

* p < .05 ** p < .01 (two-tailed)

Males N = 961.

[a] Only variables entered in final block shown.

Drug offences among males. Drug offences among all males, as reported in Table 18, again emphasize the importance of interactions between low self-control and opportunity, and in particular the opportunities afforded by unsupervised association with friends. Getting together with friends and drinking (*b* = .34), and getting together with friends and risk-seeking (*b* = .33) are identified as the strongest predictors, with additional interaction effects identified for driving around with friends and smoking (*b* = .19) and three other interaction terms. Measures of low self-control alone, however, are also significant predictors of drug offending for males, with the largest effects identified for smoking (*b* = .22).

When the sample of males is divided into age groups, the results of regressing drug offences on predictors for younger males (Table 19, section A) identify the interaction between low self-control and opportunity, again, as by far the most significant predictors of this type of offending. For these younger teens, measures of low self-control alone have *no* positive statistically significant effects. Although smoking appears to be a very significant predictor in the first block, containing measures of self-control, its effects are negative in the final equation when measures of the interaction between low self-control and opportunity are controlled. The interaction term for getting together with friends and drinking (*b* = .69), however, predicts over two-thirds of a standard deviation increase in drug offences, for every standard deviation increase in this measure. Additional substantial and significant effects are identified for driving around with friends and smoking (*b* = .41) and two other measures of the interaction between low self-control and opportunity. For older males (Table 19, section B), the interaction terms are again identified as having the strongest effects overall, with the largest increase in drug offences associated with getting together with friends and risk-seeking (*b* = .56). Two other measures of the interaction between low self-control and opportunity also predict increases in this type of offending. In addition, however, and in contrast to the effects identified for younger males above, low self-control alone as measured by smoking predicts a very substantial increase (*b* = .44).

TABLE 19
Regression of drug use on self-control and opportunity measures for males by age group

Block summary and coefficients from multiple regression analysis

A. YOUNGER MALES

	Drug use				
	(1)	(2)	(3) [a]	(4) B	b
Impulsivity	.15			.05	.06
Risk-seeking	.30			.09	.11
Temper	.08			.03	.04
Carelessness	.03			.14	.16
Present-oriented	.04			-.09	-.10
Smoking	.41			.03	.03
Drinking	.23			-.51*	-.57
Age	.16			.08	.09
Race/Asian	-.06			.01	.01
Race/Aboriginal	-.03			-.17	-.06
Neighbourhd. Income	.00			.05*	.09
Mother supervision		.09		.04	.06
Father supervision		.03		.02	.04
Curfew		-.04		-.05	-.08
Together w/friends		.01		.00	.00
Drive around		.09		-.05	-.06
Curfew*risk			-.19	-.07*	-.18
Together*drink			.64	.14*	.69
Drive*risk			.25	.07*	.21
Drive*present			-.18	-.09*	-.19
Drive*smoke			.49	.12**	.41
Mother super*present			.30	.07*	.28
Father super*careless			-.21	-.04*	-.21
Rsq:	.32	.34	.45	Adj. Rsq:	.41

* p < .05 ** p < .01 (two-tailed)

Younger males (11-14): N = 337.

[a] Only variables entered in final block shown.

B. OLDER MALES

	Drug use				
	(1)	*(2)*	*(3)* [a]	*(4)* B	*b*
Impulsivity	*.07*			.06	*.03*
Risk-seeking	*.18*			-.59**	*-.42*
Temper	*.00*			-.01	*-.00*
Carelessness	*.08*			.03	*.02*
Present-oriented	*-.04*			-.05	*-.03*
Smoking	*.64*			.39**	*.44*
Drinking	*.21*			.04	*.03*
Age	*.09*			.06	*.04*
Race/Asian	*-.12*			-.28*	*-.07*
Race/Aboriginal	*-.02*			-.13	*-.02*
Neighbourhd. Income	*-.01*			-.01	*-.01*
Mother supervision		*.07*		-.05	*-.03*
Father supervision		*.06*		.05	*.07*
Curfew		*.04*		.02	*.02*
Together w/friends		*.07*		.09	*.06*
Drive around		*-.01*		-.03	*-.02*
*Curfew*careless*			*-.10*	-.07*	*-.12*
*Together*risk-seeking*			*.59*	.18**	*.56*
*Mother super*careless*			*.15*	.06*	*.15*
Mother super drink*			*.22*	.05*	*.22*
Rsq:	.49	.50	.53	Adj. Rsq:	.51

* p < .05 ** p < .01 (two-tailed)

Older males (15-18): N = 624.

[a] Only variables entered in final block shown.

These findings for drug offences committed by males, as with the previous analyses for this type of offending, differ markedly from the effects identified for general delinquency and for property offences. General delinquency for all males was predicted, in large part, by the degree to which these youths were assumed to lack self-control, as measured by several different indicators. An additional contributor to this type of offending was the interaction between the preference for risk-seeking and getting together with friends. Property offences for this group were seen to be even more strongly predicted by measures of low self-control alone, with no interaction effects identified as statistically significant.

This pattern was in general replicated, for both types of offending, when the sample of males was divided into younger and older groups. General delinquency among younger males was predicted to increase somewhat on the basis of direct measures of low self-control, but far greater effects were identified for the interactions between low self-control and opportunity. For older males, however, opportunities for general delinquency would appear to be widespread, with increases in this measure of offending associated primarily with the direct effects of low self-control. This general decrease in the role attributed to the interactions of low self-control and opportunity was found to be even more pronounced for property crimes. Younger males, as discussed above, appear to be more greatly influenced by the need for opportunity, in combination with low self-control; older males, on the other hand, would appear to have relatively unlimited access to opportunities for property crime, so that their reported involvement in this type of offending is to a very great extent a function of their self-control as measured by several different indicators.

The occurrence of drug offences, however, appears to be closely related to the combination of low self-control and opportunity. Various measures of the interaction between these two concepts are the most important predictors in each analysis, overshadowing the effects identified for low self-control alone. The relative importance of these terms, however, appears to be closely related to the general level of freedom (and hence opportunity) assumed to arise for particular groups of teens. For younger males, who are assumed to have lesser opportunities, measures of low self-control alone do not predict any direct increase in drug offences; instead, this type of offending appears to be related almost entirely to the availability of opportunities in combination with low self-control. For older males, additional increases are predicted on the basis of the direct effects for low self-control, as measured by the behavioural indicator of smoking. Yet even for older males, who are assumed to have the greatest freedom of any of the subjects considered in this study, increases in drug offences are more strongly predicted by the interaction terms. Offences involving drugs, it would seem, are very highly contingent on opportunity, both in freedom from parental supervision and more specifically in spending a great deal of unsupervised time with friends.

A final observation about the differences in effects identified for drug-related offences arises with respect to the measures of opportunity themselves. In almost every one of the analyses discussed thus far in this study, measures of opportunity (particularly mother's supervision) were identified as have statistically significant direct effects on the likelihood of offending. While the effects identified were generally very modest, never exceeding those reported for measures of low self-control, and only rarely exceeding those for interaction terms, they were nevertheless quite consistent. For drug offences, however, the measures of opportunity have *no direct statistically-significant effects*; even the previously-noted factor of mother's supervision appears to be of relatively minor importance in this type of offending, except as it interacts with low self-control.

VIOLENT OFFENCES

Violent or personal offences form the third and final type of delinquency to be investigated in this research. The general delinquency scale had contained five items that related to crimes of this nature, and these items were used to construct a composite violence scale. Like drug offences, violent offences did not form a reliable scale for all teens in this study. For the total sample, females, and younger teens of both sexes, the occasional incident of violence correlates highly enough with other offences to be viewed as part of an overall pattern of general delinquency, but does not necessarily correlate highly with other *violent* offences. Among older teens and males, however, violent offences were found to have sufficient inter-item reliability to be viewed as a specific type of offending. For these groups, therefore, the violence subscale was regressed on the measures of low self-control, opportunity, and their interactions in order to evaluate the impact of these predictors on violent offending. Items contained in this scale include some relatively minor offences, opportunities for which are assumed to be widespread, and some more serious ones, opportunities for which might be most restricted. In light of this composition, and based on the assumptions of General Theory, the factors associated with this type of offence are expected to be similar to those for more general delinquency, in spite of the more restricted range of offences under consideration.

Violence and older teens. The most significant predictors of violent offences among older teens, as reported in Table 20, are the interactions between low self-control and opportunity. Getting together with friends and risk-seeking (b = .30), and mother's supervision and smoking (b = .21), predict the largest increases in the dependent variable when other factors are controlled; and their effects surpass those identified for measures of low self-control alone. Significant but smaller effects are identified for some measures of low self-control, including the factor scores for temper (b = .15) and impulsivity (b = .12), and for drinking (b = .09). Risk-seeking behaviour and smoking, by contrast, are negative and non-significant. Although these measures have been consistently identified as strong predictors of delinquency in many of the preceding findings, and appear to have very substantial effects in the first block, these effects disappear in the final results when interactions with opportunity are controlled.

TABLE 20

Regression of violence on self-control and opportunity for older teens

Block summary and coefficients from multiple regression analysis

	Violence				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.14*			.25**	*.12*
Risk-seeking	*.28*			-.08	*-.04*
Temper	*.14*			.29**	*.15*
Carelessness	*.08*			.08	*.04*
Present-oriented	*.07*			.14**	*.07*
Smoking	*.25*			-.06	*.05*
Drinking	*.12*			.14**	*.09*
Sex	*.28*			.70**	*.18*
Age	*-.07*			-.18**	*-.09*
Race/Asian	*-.04*			-.10	*-.02*
Race/Aboriginal	*.06*			.41*	*.05*
Neighbourhd. Income	*-.05*			-.04	*-.03*
Mother's supervision		*.10*		.02	*.02*
Father's supervision		*.06*		.08**	*.09*
Curfew		*.03*		-.05	*-.04*
Together w/friends		*.05*		.06	*.03*
Drive around		*.01*		.01	*.01*
*Curfew*smoking*			*.11*	.05**	*.13*
*Together*risk-seeking*			*.29*	.13**	*.30*
*Mother's super*smoke*			*.23*	.05*	*.21*
*Father's super*smoke*			*-.15*	-.03*	*-.15*
Rsq.	.28	.30	.31	Adj. Rsq:	.30

* $p < .05$ ** $p < .01$ (two-tailed)

Older teens (15-18): N = 1325.

[a] Only those variables entered in final block shown.

Violence and males. When violent offences were regressed on predictors for males, the interaction between low self-control and opportunity is again identified as the most important factor, with the most substantial effects identified for getting together with friends and smoking (b = .37) (Table 21, section A). Measures of low self-control, however, are also associated with the increased likelihood of violence, although to a somewhat lesser degree. Statistically significant direct effects are reported for risk-seeking (b = .24), impulsivity (b = .17) and drinking (b = .11). Smoking, which again appears to be a strong predictor in the first block, is negative and non-significant in the final block when its interaction with opportunity is controlled.

When the sample of males is further split into age groups, and violence is regressed on predictor variables for older males (section B of Table 21), this pattern is even more pronounced. For these teens, getting together with friends and smoking is a very strong predictor (b = .52), with each standard deviation increase in the interaction term accounting for over one-half standard deviation increase in the violence scale when other factors are controlled. Of the other measures, the only ones that are statistically significant are risk-seeking behaviour (b = .25), impulsivity (b = .12), present-oriented (b = .08), and another interaction term between curfew and temper (b = .13). As in the previous two analyses, the seeming importance of smoking as a predictor, seen in its large coefficient in the first block, is substantially reduced in the final results by the strength of effects of the interaction term to which it contributes.

These findings for violent offences are somewhat dissimilar to those observed for general delinquency, and are very dissimilar to those found for property crimes, although not in ways that challenge General Theory. Delinquency among older teens, measured by the broader, more general scale, was found to be predicted most strongly by measures of low self-control alone. Smaller significant effects were identified for interactions between low self-control and opportunity, particularly those involving mother's supervision. For males, although the strongest predictors overall were again seen to be measures of low self-control, getting together with friends in interaction with the preference for risk-seeking predicted a substantial increase in offending. General delinquency among older males, on the other hand, was predicted by measures of low self-control, rather than by any interactions between low self-control and opportunity. Property crimes committed by older teens, males, and older males were strongly associated with measures of low self-control; none of the measures of the interaction between low self-control and opportunity were identified as significant predictors in any of these analyses. By contrast, violent crimes appear to be much more contingent on the interaction between low self-control and opportunity, and particularly the type of opportunity that is afforded by getting together with friends in the absence of adult supervision.

TABLE 21
Regression of violence on self-control and opportunity for males and older males

Block summary and coefficients from multiple regression analysis

A. MALES

	Violence				
	(1)	*(2)*	*(3)* [a]	*(4)* *B*	*b*
Impulsivity	*.21*			.38**	*.17*
Risk-seeking	*.29*			.49**	*.24*
Temper	*.13*			.08	*.04*
Carelessness	*.03*			.10	*.05*
Present-oriented	*.10*			.20**	*.09*
Smoking	*.34*			-.31	*-.23*
Drinking	*.15*			.19**	*.11*
Age	*-.02*			-.09*	*-.08*
Race/Asian	*-.07*			-.09	*-.02*
Race/Aboriginal	*.06*			.32	*.04*
Neighbourhd. Income	*-.04*			-.02	*-.02*
Mother's supervision		*.10*		.11*	*.08*
Father's supervision		*.06*		.06	*.06*
Curfew		*.03*		.00	*.00*
Together w/friends		*.11*		.15*	*.07*
Drive around		*.03*		.04	*.03*
*Curfew*temper*			*.10*	.10*	*.11*
*Together*smoke*			*.37*	.11*	*.37*
Rsq.	.28	.31	.32	Adj. Rsq:	.30

* p < .05 ** p < .01 (two-tailed)

Males N = 961.

[a] Only those variables entered in final block shown.

B. OLDER MALES

	Violence				
	(1)	*(2)*	*(3)* [a]	*(4) B*	*b*
Impulsivity	*.16*			.27**	*.12*
Risk-seeking	*.29*			.49**	*.25*
Temper	*.14*			.07	*.03*
Carelessness	*.04*			.05	*.02*
Present-oriented	*.08*			.19*	*.08*
Smoking	*.33*			-.45	*-.37*
Drinking	*.13*			.15	*.09*
Age	*-.04*			-.17*	*-.08*
Race/Asian	*-.09*			-.21	*-.04*
Race/Aboriginal	*.05*			.26	*.03*
Neighbourhd. Income	*-.07*			-.08	*-.06*
Mother's supervision		*.10*		.09	*.06*
Father's supervision		*.09*		.08	*.07*
Curfew		*.02*		-.03	*-.02*
Together w/friends		*.13*		.14	*.06*
Drive around		*.03*		.04	*.02*
*Curfew*temper*			*.13*	.12*	*.13*
*Together*smoke*			*.51*	.14*	*.52*
Rsq.	.27	.29	.31	Adj. Rsq:	.29

* p < .05 ** p < .01 (two-tailed)

Older males (15-18): N = 624

[a] Only those variables entered in final block shown.

Hypotheses for different types of crime. The series of hypotheses introduced in Chapter 2 had predicted that measures of low self-control would significantly predict the likelihood of delinquency (H1), and that low self-control in combination with opportunity would also predict delinquency (H2). The final set of hypotheses had applied these statements to different *types* of delinquency, stating that *measures of low self-control and the interactions between low self-control and opportunity will similarly predict the likelihood of property crimes* (H5); that *measures of low self-control would similarly effect the likelihood of drug offences*(H6a); that *interactions between low self-control and opportunity would have a greater impact on the likelihood of drug offences* (H6b); and that *measures of low self-control and the interactions between low self-control and opportunity would similarly predict the likelihood of violent crimes* (H7). The argument advanced regarding these hypotheses was that low self-control alone should make it equally likely that youths would commit a variety of offences, including property, drug, and violent offences. Opportunities for both property and violent or personal crimes were argued to be relatively widespread, so that the interaction between low self-control and opportunity would similarly predict an increase in both of these types of offending. Opportunities for offences involving drugs, however, were assumed to be more limited than those for other forms of delinquency; it was therefore concluded that the interaction between low self-control and opportunity would play a greater role in their occurrence.

For property crimes, as discussed in detail above, measures of low self-control alone have been identified as significant predictors for all teens is this study, with at least some of the measures of this concept (predominantly risk-seeking and one or both of the behavioural measures of smoking and drinking) identified as statistically significant. The significance of the interaction between low self-control and opportunity, however, has been found to be highly variable, depending on the age and gender of subjects. For females and for younger teens of both sexes, the effects of this interaction appear to be of greater significance than low self-control alone. For older teens and/or males, however, the interaction with opportunity was not found to be a significant contributor to the likelihood of committing property crimes; for these teens, property-related offending is very substantially predicted simply by low self-control, as measured by several indicators.

Drug offences, by contrast, were associated to a much greater degree with the interaction between low self-control and opportunity than with measures of low self-control alone. In fact, for younger males, no increase in drug offences can be predicted to occur based on measures of low self-control; for this group of teens, offences of this sort are predicted almost entirely based on the interaction with opportunity -- again, opportunities that involve getting together with friends. Violent offences follow this same pattern, although to a somewhat lesser degree, with the interactions between opportunity and low self-control predicting much greater increases in the likelihood of this behaviour than low self-control by itself.

The complex and shifting roles played by low self-control, on the one hand, and low self-control in combination with opportunity, on the other, in predicting the likelihood of different types of offending among these teens provide little justification for rejecting the null hypotheses for all of these predictions. Hypothesis 5, which predicted results for property offences would be similar to those for general delinquency, is supported, as is H6b, regarding the greater significance of the interaction between low self-control and opportunity for drug offences. H6a, however, predicted that low self-control alone would be a significant predictor of the likelihood of drug offences; and this expectation was not borne out by the results. The final hypothesis, H7, had predicted that effects for violent offences, like those for property offences, would be very similar to those for general delinquency. Substantial differences in the predictors were found, however, with violent offences seen to be more closely associated with the interaction terms than with measures of low self-control alone. This hypothesis, too, is therefore not supported. However, the lack of support for some of these hypotheses regarding the patterns of offending cannot be construed as a challenge to the assertions of General Theory. Rather, these results have supported the theory's statement that low self-control is a versatile cause of all types of offending, and the corollary statement that the *actual nature* of that offending is highly contingent on circumstances and opportunity. As noted earlier in this chapter, the teens who commit one category of offence are the same ones who commit others; the degree to which they become involved in any particular *type* of offending, however, is dictated by their age and gender, the relative freedom from supervision that they encounter, and their associations with others.

CHAPTER 7

DISCUSSION AND CONCLUSION

The primary objective of the research presented in the preceding chapters was to evaluate the relationship between low self-control and delinquency as proposed by Gottfredson and Hirschi's *General Theory of Crime* (1990). At the same time, this study has addressed a number of secondary issues raised by previous researchers, and in addition has examined several of the theory's corollary propositions about the effects of age, gender, and the versatility of offending. The causal argument advanced by General Theory is straightforward: some people are inclined to commit criminal acts because they lack self-control. Crimes require little effort and planning, and offer immediate gratification for short-term desires; they therefore appeal to the low self-control person who has little incentive to resist the temptations they offer. The extent to which inclination alone actually leads to crime, however, is contingent to some degree on circumstance and opportunity. Opportunities in general are assumed to be widely available; but the easy completion of some criminal acts may be limited by a number of situational factors. In addition, the actual frequency of criminal activity varies with age, rising to a peak in mid-adolescence and then declining thereafter -- differences attributed by General Theory in part to changes in opportunity that accompany age, but also to an invariant "age effect." Gender, too, effects the actual rate of offending, with girls in general committing fewer crimes than males. Lower female rates occur, according to General Theory, because females are socialized differently and may therefore have greater self-control; additionally, their opportunities may be much more restricted.

When all of these factors are taken into consideration, however, the person with low self-control of any age and either sex is predicted to be highly likely to commit a variety of crimes. And in keeping with this expectation, the results of this study have consistently identified robust relationships between low self-control and reported delinquency. Multiple indicators of low self-control, particularly a preference for risk-seeking, smoking, and drinking, predict increased delinquency; and these effects are evident for younger and older teens, for males and females, and in relation to various different measures of offending. At the same time, the results of this analysis have identified a highly complex relationship between opportunity and crime. The dimension of opportunity addressed here is an admittedly restricted one, derived primarily from the situational opportunities afforded to juveniles by weak parental or adult supervision. Thus, the study has not adequately addressed the wider environmental context of opportunities for crime identified by routine activities theory (Cohen and Felson 1979; Felson and Cohen 1980). Based on this more limited conception, however, the results reveal that opportunity is not of equal importance for all types of offending, or for all potential offenders. For some types of delinquency, opportunities appear to be widespread, so that their occurrence is predicted largely by the low self-control of subjects. Other more specific categories of offending, however, were found to be predicted primarily by the interaction between low self-control and opportunity. Similarly, for some potential offenders, particularly older teens and males, the issue of opportunity is of less importance than it is for younger teens, or females. These varying relationships identified for the interaction between low self-control and opportunity tend to support Gottfredson and Hirschi's argument about the relevance of opportunity (1990; Hirschi and Gottfredson 1993), although they differ somewhat from the findings of previous researchers that have incorporated a direct measure of opportunity (Grasmick et al 1993).

The issue of measurement. One of the persistent issues raised by commentators on General Theory (Akers 1991; Barlow 1991) and researchers who have investigated it as an explanation for crime (Arneklev et al 1993; Brownfield and Sorenson 1993; Grasmick et al 1993) has been the question of how to conceptualize and measure low self-control. Gottfredson and Hirschi (1990) argue that low self-control is a behavioural *propensity* rather than a trait, so that its occurrence must be determined indirectly, by the tendency to act in certain ways. Based on the description of low self-control persons as impulsive, careless, and present-oriented, with a tendency to prefer risky behaviours and exercise little control over temper, a number of previous examinations of the theory have incorporated these psychological manifestations into a single, personality-based measure of low self-control (Arneklev et al 1993; Brownfield and Sorenson 1993; Grasmick et al 1993). Gottfredson and Hirschi claim, however, that noncriminal but deviant behaviours such as smoking and drinking provide better indicators of the existence of low self-control than psychological traits alone. In addition, they insist that low self-control manifests itself in multidimensional ways rather than consistently and uniformly in all situations.

In order to address these issues, this study used low self-control's psychological manifestations, as identified by Gottfredson and Hirschi and as employed by other researchers, but retained them as separate measures rather than as part of a single composite scale. In addition the extent to which juveniles in this study reported smoking and drinking were used as further measures of low self-control. The results have tended to support Gottfredson and Hirschi's assertion regarding the multi dimensionality of the concept, and in addition offer a basis for interpreting the somewhat ambiguous findings of earlier studies that have relied on a unidimensional scale. All measures of low self-control in this study were found to predict greater delinquency, but not to the same degree, nor with the same consistency. By far the most robust predictors, identified across age and gender samples and for most categories of crime, are the behavioural measures of smoking and to a lesser degree drinking, and the preference for risk-seeking. Other measures of low self-control, however, while less prominent in the results overall, were found to be of greater significance in the occurrence of specific types of offences or for certain groups of teens. Thus, it might be concluded that combining all of these measures into a single scale would tend to mask their variability, and therefore attenuate their effects.

That self-control itself is multidimensional in its expression, as evidenced in the varying strength of predictors for different behaviours, raises an additional issue regarding measurement: variation in criminal behaviour itself. A number of previous studies have used restricted definitions of crime (Brownfield and Sorenson 1993; Grasmick et al 1993), or have used adult samples that were, in general, non-criminal. Grasmick et al, for example, report that 87% (for fraud) and 91% (for force) of their respondents reported *no* criminal behaviour based on these two measures of crime (1993:18). By contrast, in the current research based on juveniles, nearly two-thirds of the respondents reported having committed one or more of twenty specific delinquent acts during the last year. This greater variation in the dependent variable is important not only for statistical reasons, in permitting a clearer identification of effects, but also from the standpoint of understanding the relationship between low self-control and opportunity in connection with specific *types* of delinquency. Gottfredson and Hirschi claim that all types of crime are highly correlated, and that persons with low self-control are equally likely to commit any of them, an assertion that is generally supported by the results of this study. But not all types of crime are committed with equal frequency, nor with equal ease. Thus, there is a variability in the degree to which measures of low self-control interact with opportunity to predict crimes -- a variability that is only evident if a broad range of potential criminal acts is considered.

The issue of opportunity. The actual commission of crime or delinquency is shaped by a number of considerations, including opportunity (Gottfredson and Hirschi 1990:137). Only a couple of previous tests of General Theory have directly considered the role opportunity plays in the occurrence of criminal events (Grasmick et al 1993; Kennedy and Forde 1995), but both raise questions about the adequacy of Gottfredson and Hirschi's explanation of its importance. Grasmick et al (1993) report a direct effect for their measure of opportunity that exceeds the effects of both low self-control alone and the interaction between low self-control and opportunity. Similarly, Kennedy and Forde (1995) found the situational factors associated with routine activities and risky lifestyles significantly predicted the likelihood of their respondents' offending. Gottfredson and Hirschi, however, dispute the idea that opportunity is an important element for *all* crimes. While acknowledging that situations permitting the commission of specific crimes might be severely restricted (Hirschi and Gottfredson 1993:50), they contend that opportunities to commit one or another crime are limitless. Thus, while greater opportunity would increase the frequency with which low self-control persons offend, it is not a necessary condition for all offending. The individual with low self-control would be virtually guaranteed to encounter *some* situations of opportunity, no matter how severely limited his/her circumstances might be.

The measures of opportunity employed in this study do not permit any consideration of the importance of structural opportunity, in the form of neighbourhood guardianship or environmental factors contributing to the availability of targets or victims. Instead, opportunity for these juvenile subjects was conceptualized and measured primarily in terms of individual freedom of movement and lack of parental supervision. At the same time, however, an additional aspect of opportunity was addressed by the inclusion of two measures of time spent with friends, either driving around or simply "hanging out"; and these two measures can be seen as reflecting, to some degree, risky lifestyles.

Based on these elements of opportunity, the results obtained in this analysis have provided consistent support for Gottfredson and Hirschi's arguments about the widespread availability of opportunity, while at the same time demonstrating the significant role that opportunity plays in the occurrence of some types of crime. Low self-control alone was found to be the strongest predictor for the amount of general delinquency committed by these teens. It would seem that even closely supervised teens who lack self-control encounter situations where their inclinations lead to delinquent acts -- on the way home from school, perhaps, at the local convenience store, in the parking lot of the local mall, or even at school. Nevertheless, this general finding does not apply equally to all subjects, nor to all types of delinquency. Females and younger teens were found, in general, to have somewhat lesser opportunities than males or older teens, in that they reported closer parental monitoring and spent less unsupervised time with friends. Moreover, even when these differences were controlled by splitting the sample into age/gender specific groups, the interaction between low self-control and opportunity proved to be of greater importance in predicting delinquency among these two groups than for their counterparts.

At the same time, measures of opportunity were particularly relevant in the occurrence of some *types* of crimes. The interaction between low self-control and opportunity played a prominent role in the extent to which subjects reported involvement in either drug offences or violence -- particularly that element of opportunity assessed by getting together with friends. It would seem that inclination alone, in the form of low self-control, is adequate to predict the likelihood that youths will commit many crimes, such as vandalism, shoplifting, or minor property crimes. But the likelihood of getting involved in a gang fight or using drugs is highly contingent on opportunities to do so, and these opportunities, in turn, are related to what can be described as risky lifestyles -- the amount of time spent away from home with other young persons, and the resulting greater exposure to situations conducive to delinquency.

A final issue regarding the role of opportunity arises concerning the direct effects identified for measures of this concept even when low self-control and its interactions with opportunity are controlled, a finding that parallels Grasmick et al's results (1993). Opportunity, particularly in the form of weak mother's supervision, predicted modest but significant increases in delinquency in many of the analyses discussed in the preceding chapters -- particularly for property offences and general delinquency, although not for drug offences. Does this mean that opportunity alone results in a greater likelihood of some types of offending, beyond any inherent propensities of youths themselves? It might, of course, and there is no way to determine, within the context of this study, whether that is the case. There are, however, other possible explanations. Support for the independent effects of opportunity would require the assumption that measures of low self-control were exhaustive and nearly perfect -- that there were no residual elements of inclination that might appear in response to increased opportunity. And while the measures of low self-control employed in this study were broad, incorporating several psychological and behavioural expressions of the concept, it seems tenuous to conclude that these measures index *all* of the dimensions of inclination. In addition, the effects associated with opportunity alone are consistently weak; in none of the analyses do they exceed, or even approach, the magnitude of effects identified for measures of low self-control or the interaction effects. Thus, these results cannot be seen as inconsistent with the explanation offered by General Theory.

The age effect. According to General Theory, age is a theoretically irrelevant correlate of offending. The frequency of involvement in delinquency tends to rise through the teens, peaking in the midteens and then declining somewhat thereafter; and youths of all ages commit more crimes than any other age group. This pattern, however, is attributed by Gottfredson and Hirschi to an invariant "age effect" that occurs partly due to changes in circumstances and opportunity, and partly simply due to aging (Gottfredson and Hirschi 1990:141). When age and opportunity are controlled, therefore, low self-control is expected to predict crime similarly for teens of all ages.

In order to examine this assumption, the present analysis divided respondents in this study into two groups, using their peak age of offending (15) as the cutoff point, and then evaluated the causal factors for each group. Younger teens reported, on the whole, greater supervision by parents, and lower rates of delinquency, both on the general composite scale and the subscale of property. But when these differences were controlled, the findings were supportive of Gottfredson and Hirschi's argument. While the magnitude of some effects differs, and the interaction between low self-control and opportunity is more significant in predicting the delinquency of younger teens, the two elements of low self-control and its interaction with opportunity are highly associated with the likelihood of delinquency for both groups. Teens who reported that they smoked, drank alcohol, and preferred taking risks were also highly likely to be delinquent, regardless of their age. When these tendencies were combined with weak parental supervision, they were likely to report even greater delinquency. Within the context of this research, then, low self-control appears to be equally relevant in the offending of teens of all ages.

Gender and opportunity. The widely-acknowledged differences in male and female rates of offending, according to Gottfredson and Hirschi, can also be explained in the context of General Theory. Females, it is argued, are supervised more closely than males from earliest childhood; and this differential socialization may lead to lesser criminal propensities during the teens -- girls, in other words, are hypothesized to have generally greater self-control. At the same time, during the teen years, girls remain under stricter parental supervision than males, so that the degree to which they encounter opportunities for crime is reduced. Moreover, some research has suggested that gender-based differences in supervision vary with age. Both males and females may be closely monitored during their early teens; but as they enter the mid-teens, males are accorded a greater relaxation in supervision than females (Chesney-Lind and Shelden 1992).

Thus, differences both in propensity and in opportunity as it relates to gender and age are seen as accounting in large part for lower rates of female offending. Nevertheless, based on General Theory is was predicted that those females who lacked self-control would be just as likely to commit delinquent actions as their male counterparts, if they had the opportunity to do so. In order to evaluate this assertion, the sample of juvenile respondents in this study was initially split into two groups on the basis of gender, and then subsequently into four groups on the basis of both age and gender. Females were found, as expected, to differ significantly from males on measures of low self-control, and they were also supervised more closely. For teens of both sexes, however, low self-control and its interaction with opportunity predicted increased delinquency. While the most significant personality indicator of low self-control differed for each group, with greater delinquency associated with risk-seeking behaviour for girls and impulsivity for boys, these differences can be seen as reflecting the multi dimensionality of low self-control, discussed above. It might be concluded that differential socialization leads females to express their propensities in different ways. But in spite of the differences between males and females, teens of either sex who reported smoking and drinking were likely to be delinquent. Similarly, although females were generally more closely supervised than males, weaker supervision in interaction with low self-control predicted greater delinquency for both sexes.

When the sample was further split into younger and older teens of both sexes, differences in measures of opportunity were more pronounced, with females of both age groups subjected to greater parental supervision than males of comparable age. While some relaxation in supervision accompanied increasing age for all teens, for females this change was relatively slight; for males, on the other hand, the decrease in parental supervision was far more substantial. In spite of these differences, however, and despite marked variation in the number of delinquent acts reported by teens within each of these groups, low self-control and its interaction with opportunity were significant predictors of delinquency for all teens. The degree to which the interaction between low self-control and opportunity contributed to greater delinquency, however, differed depending on age and sex. It was most important for younger teens of both sexes, more important than low self-control alone, reflecting the greater supervision these youths receive and the their resulting lesser opportunities, while it was non-significant for older males, who can be assumed to have relatively greater opportunity. But in other cases, consistent with the argument offered by General Theory, the interaction between low self-control and opportunity predicted greater delinquency.

The versatility of offending. Gottfredson and Hirschi argue that all types of crime and deviance are highly correlated, with offenders equally likely to commit any crime if they have the opportunity to do so. Thus, low self-control and opportunity were expected to similarly predict crimes of all types, and to do so for all teens in this study. The reliability of the general delinquency scale for all groups, young and old, male and female, and all combinations thereof, supports the assumption of versatility. The lesser delinquency of younger females, for example, in combination with the closer supervision they reported, means that they can be expected to report less involvement in specific types of offending that are contingent on opportunity. But where such behaviours were reported by younger teens, they were highly correlated with other delinquent actions, supporting the assumption of versatility. Older males, on the other hand, had the greatest amount of opportunity, and moreover were at the peak age of offending; they reported involvement in all types of crime. For this group, too, a general delinquency scale was highly reliable.

In addition to examining delinquency as measured by a broad general scale, however, and to further assess the assumed versatility of low self-control's effects, offences were divided into categories of property, drugs, and violence. These subscales were then used as measures of specific types of offending, for all youths and for those groups for whom subscales were reliable. Property offences formed the largest category, and were also the most consistently reported by all groups. The property subscale was reliable for all teens in this sample, including the least-delinquent group of younger females. Drug offences and violent offences, by contrast, formed a reliable subscale only for certain groups (older teens and males).

Overall, the findings were again consistent with General Theory's assumption of versatility. The importance of opportunity as a factor contributing to delinquency varied widely, as seen by the differences in the effects of the interaction terms, both for different types of crime and for specific groups of teens. The interaction between low self-control and opportunity was more significant in predicting drug offences and violence than it was for property offences, a finding that suggests that opportunities for property offences are more widely available, and less contingent on specific circumstances, than for other types of offending. Similarly, the interaction was more important in the patterns of offence reported by younger teens and females than older teens and males, again emphasizing that for the former groups, opportunity in the form of reduced supervision is an important contributor to offending.

When these two aspects of specific types of offences and specific groups of offenders are combined, it is not surprising that for any given type of crime, the same sort of pattern was evident. Property offences committed by older males were predicted almost exclusively by measures of low self-control alone. While a small increase was predicted from direct measures of opportunity, the interaction between low self-control and opportunity was not significant. For this group of youths, who are assumed to have a great deal of freedom due to their age and gender, opportunities for the types of offences included in the property subscale appeared to be readily available. Whether they committed such offences or not, therefore, was largely a function of their inclination, as reflected in the measures of low self-control. At the other extreme, drug abuse among younger males were predicted almost entirely by the interaction terms, leading to the conclusion that for these youths, inclination alone, in the form of low self-control, is not likely to result in this type of offending without a necessary form of opportunity. Violent offences, like drug offences, were found to be highly contingent on opportunity, although not to the same degree. The interaction between low self-control and opportunity was more important in predicting this type of offending than low self-control alone. This finding is in contrast to the expectation that opportunities contributing to violence were widespread, so that their occurrence would reflect the inclinations of offenders.

The *nature* of opportunity most important in the occurrence of both drug offences and violence, in addition, was somewhat different than for general delinquency or property offences. The most prominent interactions for both of these two former types of delinquency were the combinations of low self-control and unsupervised association with peers -- either driving around with no place in particular to go, or simply "hanging out" together. Both of these types of offending, it would appear, are group activities, much more likely to arise in the context of what can be described as "risky lifestyles" for teens.

CONCLUSION

This study represents a far more thorough evaluation of General Theory than any published to date. It has examined, in addition to the central causal relationship between low self-control and crime, a number of secondary aspects of the theory that have not been previously addressed -- the importance of low self-control in predicting delinquency for different age groups and for both genders, and for various types of crime. The conceptualization and measurement of key concepts followed, as closely as possible, the descriptions offered by Gottfredson and Hirschi, both in their presentation of the theory and in later commentary on efforts to test it (1990; Hirschi and Gottfredson 1993). Low self-control was viewed as multidimensional, and was measured by a more varied set of both psychological and behavioural indicators than employed in previous research. Criminal actions, too, were evaluated by a much wider range of specific delinquent items than measures used in earlier research. At the same time, the analysis focused on only those factors identified as causally relevant by General Theory -- low self-control and opportunity. No other measures were incorporated, except for several exogenous variables; neither structural conditions such as social class, nor more proximate individual-level variables such as peers or school performance, were evaluated as having an impact on delinquency.

The reported results have been remarkably supportive of the theory. Low self-control and its interactions with opportunity appear to be very robust predictors of delinquency, for teens of all ages, for both sexes, and for crimes of all types. And they do so to a surprising degree: the explained variance reported in the preceding results, in many cases exceeding 50%, is noteworthy particularly in view of the highly parsimonious causal model employed. Yet the omission of other factors besides low self-control and opportunity means that few alternative hypotheses, based on other theories, can be generated; thus it is difficult to adequately evaluate General Theory against competing explanations.

Hagan and his associates (1985, 1988), for example, attribute lower female delinquency to differences in parental supervision and the preference for risk-seeking -- two factors consistently identified as significantly associated with delinquency in this analysis, and moreover found to be strongly predictive of gender differences. But Hagan's power-control theory attributes differential supervision to unbalanced power relationships in the family, which in turn are linked to structural factors of class and authority in the workplace. General Theory, by contrast, does not ascribe gender-based differences in supervision to class or any other specific social or cultural factor. Instead, they are assumed to pre-exist within the context of family socialization practices (Miller and Burack 1993).

Moreover, class itself, along with most other structural factors, is generally irrelevant to the theory's micro-social focus. Social class is discussed only peripherally, in relation to white collar crime (Gottfredson and Hirschi 1990:181-183) and in a brief review of social disorganization and strain as earlier representatives of "positivist social science" (1990:79-80). Both of these contexts, however, are relevant to the issue of opportunity -- on the one hand in the form of the highly restricted opportunity to commit a specific type of crime, and on the other in terms of the increased environmental opportunities for crime in certain urban areas. In its concentration on the inherent propensities of offenders themselves, General Theory tends to overlook the social context in which they act. Evaluating the significance of such factors, either in terms of their contribution to the sources of inclination, as argued by Hagan et al (1985, 1988), or as they relate to opportunity (Felson and Cohen 1980), requires a much more precise conceptualization and measurement of structural factors than were available for this study. However, this would seem to be an important area for consideration in future research on General Theory.

In addition to its relative neglect of structural factors, General Theory also dismisses the relevance of more temporally-proximate individual factors such as school performance or the role of peers. These factors, Gottfredson and Hirschi argue, are not causally significant, because they are *reflections* of low self-control. Any apparent relationship between them and delinquency is thus seen as a further manifestation of that underlying propensity. Examining school performance among teens and finding a relationship between delinquency and bad grades would not necessarily provide evidence that youths who do poorly in school are more likely to become delinquent than those who do well. Instead, General Theory ascribes such a link to low self-control, as one more manifestation of its effects: youths with low self-control do poorly in school because they lack the ability to persist in their studies.

A similar argument is presented regarding the widely-acknowledged relationship between peers and delinquency. Teens who are delinquent tend to have friends who are delinquent; and some types of delinquency, particularly drug abuse, seem to be closely related to group activity (Elliott et al 1979, 1985; Erickson and Jensen 1977). This relationship is evident in the present research, as seen from the fact that drug offences and violence were contingent of the opportunities afforded by spending a great deal of unsupervised time with peers. But General Theory does not dispute the existence of these findings; instead, its disagreement with other perspectives centres on the direction and time-order of the apparent relationship. Gottfredson and Hirschi contend that peer relationships are, again, a reflection of low self-control: youths who lack self-control, who are risk-seeking and prone to delinquency, are inclined to associate with like-minded others, and these circumstances may provide the situational opportunities for some types of deviance. Alternative interpretations, however, are that youths learn to engage in such behaviours as smoking and risk-seeking from their association with others (Akers et al 1979; Krohn et al 1985; Sutherland and Cressey 1970); or that there is actually an interaction between individual propensities and peer influences (Agnew 1991; Thornberry et al 1987). These issues cannot be adequately resolved without some means of determining the time order of effects. This observation, in turn, suggests that longitudinal research, which Gottfredson and Hirschi regard as pointless, would provide a better assessment of some of their assumptions than the cross-sectional studies that they advocate (Gottfredson and Hirschi 1987).

Longitudinal research may also be the only way to address General Theory's most controversial arguments: the early family sources of low self-control, and its continuity and stability once it is established. According to Gottfredson and Hirschi, people who lack low self-control and who are prone to crime at one point in time will continue to be so at other points in time (1990:253). While actual rates of offending may change with age, low self-control itself is assumed to remain stable, and to manifest itself in other ways. The view that propensity remains invariant has far-reaching consequences, however; and Gottfredson and Hirschi explicitly acknowledge them, claiming that social programs for offenders -- treatment, jobs, or jail -- are "incapable of producing meaningful change" (1990:232). In other words, there is little to be done with high-rate offenders, whether they are juveniles or adults, other than incapacitating them to keep them out of trouble until age works its effects.

Gottfredson and Hirschi are not alone in this view, of course; a number of other contemporary social scientists have also recently advocated the idea of enduring criminal propensities (Caspi et al 1994; Wilson and Herrnstein 1985). Interest in this area is fuelled, in large part, by its implications: if certain people are more likely to commit crimes than others, and do so repeatedly, then if society can identify these individuals and incapacitate them crime will be dramatically reduced (Nagin and Paternoster 1994). There are several variations on this line of reasoning; while Gottfredson and Hirschi identify social factors in the preschool years as critical, others go further, identifying physiological and biological factors present at birth as contributing to the "criminal personality" (Buikhuisen and Mednick 1988; Eysenck 1964, 1989; Mednick et al 1987; Wilson and Herrnstein 1985). Each of these perspectives, however, agrees that once established, criminality remains highly resistant to change. And there is no question that this conception of the immutability of inclination has found a receptive audience among policy-makers and the general public, and has made a direct contribution to recent criminal justice policies that emphasize severity and incapacitation rather than rehabilitation. To many criminologists, however, the argument that experiences in very early childhood are entirely responsible for an unchanging propensity in the teens and throughout adulthood is unpalatable, constituting a form of "developmental determinism" (Bandura 1982:747; Laub and Sampson 1993).

Gottfredson and Hirschi attribute their reasoning on this subject to numerous longitudinal studies that have already been completed and have demonstrated continuity in antisocial behaviour (1990:229-35; see also Asendorpf 1992; Ensminger et al 1983; Farrington 1983; Glueck and Glueck 1950; Pulkinnen 1982, 1986; Robins 1979; Sampson and Laub 1993; Wolfgang et al 1972, 1983). While there is no question that longitudinal studies demonstrate considerable continuity, however, it remains unclear whether this phenomenon reflects an unchanging *propensity*, or whether it simply demonstrates the continuity of social factors such as dysfunctional families, economic deprivation, and unemployment (Merton 1968). In addition, it is worth noting that one of the most detailed and exhaustive studies Gottfredson and Hirschi cite (Glueck and Glueck 1950) has recently been reanalysed by Sampson and Laub (1993), whose conclusions run counter to General Theory's assumption of stability. These authors suggest that life events in early adulthood play a significant role in eventual desistance from crime, with juvenile offenders who obtain stable jobs or assume family responsibilities more likely to become law-abiding adults than those who do not (Sampson and Laub 1993).

In spite of Gottfredson and Hirschi's assertion that cross-sectional research is adequate for theory testing (1990:253), there is, quite simply, no way to verify the assertion of stability through this type of research. The study reported in the preceding pages has gone further than previous empirical tests in demonstrating support for Gottfredson and Hirschi's description of low self-control as a predictor of delinquency for youths of both sexes, all ages, and in connection with a variety of offences. Whether their remaining assertions can be confirmed, however, thereby supporting their claim that this is, indeed, a "general theory of crime," remains to be seen.

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APPENDIX 1

Survey Questions from University of Alberta Juvenile and Adolescent Behaviour Study (1994)

Original response categories for all questionnaire items reported, with recodes as indicated.

V14 *Sex.*
Response categories: 1 = male, 2 = female, 9 = no response.
Recoded as a dummy variable, 0 = female, 1 = male, 9 = missing.

V15 *Age.*
Respondents indicated their actual age at the time of the survey.

V32 *In the course of a day, how often would your mother/female guardian know where you are?*
Response categories: 1 = often, 2 = sometimes, 3 = seldom, 4 = never, 5 = no mother/female guardian, 9 = no response. Category 5 recoded as 4 (never) and 9 coded as missing.

V33 *How often would your mother/female guardian know who you are with?*
Response categories: 1 = often, 2 = sometimes, 3 = seldom, 4 = never, 5 = no mother/female guardian, 9 = no response. Category 5 recoded as 4 (never) and 9 coded as missing.

V34 *In the course of a day, how often would your father/male guardian know where you are?*
Response categories: 1 = often, 2 = sometimes, 3 = seldom, 4 = never, 5 = no mother/female guardian, 9 = no response. Category 5 recoded as 4 (never) and 9 coded as missing.

V35 *How often would your father/male guardian know who you are with?*
Response categories: 1 = often, 2 = sometimes, 3 = seldom, 4 = never, 5 = no mother/female guardian, 9 = no response. Category 5 recoded as 4 (never) and 9 coded as missing.

V77 *Do you have a set time to be home on school nights?*
V78 *Do you have a set time to be home on weekend nights?*

Response categories for both questions: 1=yes, 2=no, 3=don't know.
Recoded as 1 = yes, 2 = don't know, 3 = no, 9 = missing.

V86 *How often do you and a friend get together where no adults are present?*
V87 *How often do you and a friend drive around in a car with no where special to go?*
Response categories for both questions: 1=almost every day, 2=a few times a week, 3=once a week, 4=less than once a week, 5=never).
Recoded so that higher values represent greater frequency.

PERSONALITY FACTORS

1. Questions adapted from BPI (Jackson 1986):

V271 *I often take risks without stopping to think about the results**
V272 *I think I could break into a house and not get caught**
V273 *Ideas race through my head faster than I can speak**
V278 *I Sometimes do silly things without thinking**
V279 *Many times I act without thinking**
V283 *I often behave in a reckless manner**
V285 *I think I could write graffiti and not get caught**
V286 *I think I could steal something from a store and not get caught**
V287 *I am the type to be bored one minute and excited about something the next**
V288 *I might do something foolish for the fun on it**
V289 *I am careful in almost everything I do*
V290 *I'll try almost anything regardless of the consequences**
V291 *I can work for a pretty long amount of time without becoming bored*
V292 *I sometimes take unnecessary chances**
V293 *I am often somewhat restless**
V294 *I have a well thought out reason for almost everything I undertake*
V295 *I often leave jobs unfinished**
V296 *I generally make careful plans*
V297 *At times I am rather careless (sloppy)**
V298 *I usually say the first thing that comes into my mind**
V299 *I find it exciting to ride in or drive a fast car**

2. Questions adapted from Grasmick et al (1993):

V270 *I like to test myself every now and then by doing something a little risky**

V274 *Sometimes I will take a risk just for the fun of it**

V275 *I sometimes find it exciting to do things for which I might get caught**

V276 *Excitement and adventure are more important to me than security**

V277 *I lose my temper pretty easily**

V280 *Often when I am angry at people, I feel more like hurting them than talking to them about why I am angry**

V281 *When I have a serious disagreement with someone, it's usually hard for me to talk about it without getting upset**

V282 *The things I like to do best are dangerous **

Response categories for each of the above items: 1 = yes, 2 = no, missing values coded as 9. All items marked with an asterisk (*) were reverse recoded for purposes of analysis, so that for all items the higher value is consistent with lower self-control.

V321 *How often do you smoke cigarettes?*

Response categories: 0 = never, 1 = on occasion, 2 = one/two a week, 3 = one/two a day, 4 = less than a pack a day, 5 = more than a pack a day. Non-responses coded as 9 = missing.

V322 *How often do you drink alcoholic beverages?*

Response categories: 0 = never, 1 = on occasion, 2 = once/twice a week, 3 = a few times a week, 4 = almost every day, 5 = every day. Non-responses coded as 9 = missing.

DV14 *Mean income/categories of $10,000.* Derived from V17, which asked respondents their postal code. Postal codes were later indexed to mean income for similar family types within each postal walk, obtained from Statistics Canada.

Coded into $10,000 intervals:
1 = < 19,900
2 = 20,000 - 29,900
3 = 30,000 - 39,000
4 = 40,000 - 49,900
5 = 50,000 - 59,900
6 = 60,000 - 69,900
7 = 70,000 - 79,900
8 = 80,000 +
9 = no response.

Minority ethnic category. Derived from V335, which asked respondents: "to which ethnic or cultural group(s) do you or your family belong?" Original coding:

1. French
2. English
3. Irish
4. Scottish
5. German
6. Italian
7. Ukrainian
8. Polish
9. Dutch (Netherlands)
10. Chinese/Asian
11. Jewish
12. Black African/Caribbean
13. Inuit
14. Native Indian
15. Metis
16. Black (other)
17. Indian/Pakistanian
18. Other European
19. Other Eastern European
20. Other Southern European
21. Arabian`
22. and 23. other;
24. no response.

Recoded into two dummy variables: "Asian" for respondents of Asian background (#10), and "Aboriginal" for those of Canadian Aboriginal background (#13, #14 and #15), with other responses as the reference category for each dummy variable, and "no response" coded as 9 (missing).

DELINQUENCY QUESTIONS (V144 to 163):

In the last year I have...

1. gone into (or tried to get into) a building to steal something
2. gone into or tried to get into a building to damage something
3. tried to steal or actually stole money or other things
4. shoplifted or taken something from a store on purpose without paying
5. stolen someone's purse or wallet or picked someone's pocket
6. stolen something from a car that did not belong to me
7. tried to buy or sell things that were stolen
8. taken a car or motor cycle for a ride without the owner's permission
9. used or tried to use a credit card that I did not have permission to use
10. hit someone with the idea of hurting them
11. used a weapon (knife, bat) to hurt someone
12. been involved in a gang fight
13. used a weapon or force to take something from someone
14. thrown objects such as rocks or bottles at people
15. used marijuana
16. used hard drugs like crack, cocaine, heroin, LSD or other non-prescription drugs
17. physically hurt someone to force them to have sex with me
18. sold drugs such as marijuana
19. sold drugs such as crack, heroin, LSD, cocaine
20. run away from home.

(Response categories for each question: 0=never, 1=once, 2=two/three times, 3=more than three times).

Reported vandalism, taken from six items regarding six specific targets, were summed and then recoded as a single item using the above categories. The resulting vandalism index was then added as a single additional delinquency item (V165=school window; V184=school property; V202=park equipment; V218=public building; V235=phone booth or bus shelter; V254=house, car, or bottles in street).

APPENDIX 2.1
Bivariate correlations
Table 1. Total Sample (N = 2095)
Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9	10
1. Delinq	...									
2. Impuls	.391**	...								
3. Risky	.411**	.005	...							
4. Temper	.158**	-.008	-.006	...						
5. Careless	.205**	.009	.007	.017	...					
6. Noplan	.088**	-.002	-.002	-.003	.013	...				
7. Smoke	.488**	.215**	.187**	.119**	.075**	.071**	...			
8. Drink	.536**	.312**	.250**	.087**	.117**	.03[illegible]	.560**	...		
9. Age	.170**	.152**	.000	.023	-.014	-.029	.263**	.345**	...	
10. Curfew	.127**	.089**	.053**	.007	.042	-.029	.058**	.142**	200**	...
11. Together	.301**	.257**	.117**	.057**	.055*	.011	.241**	.285**	.136**	.109**
12. Drive	.328**	.281**	.126**	.066**	.021	.013	.319**	.399**	.396**	.095**
13. Mosuper	.367**	.160**	.210**	.081**	.142**	.019	.222**	.278**	.173**	.217**
14. Fasuper	.302**	.207**	.120**	.093**	.114**	.032	.222**	.254**	.157**	.181**
15. Sex	.209**	.096**	.219**	-.032	.043	-.075**	-.032	.075**	.029	.126**
16. Race/As	-.124**	-.099**	-.027	.005	-.053*	.019	-.130**	-.178**	-.021	.024
17. Race/Ab	.120**	.033	.071**	.039	.036	.046*	.123**	.078**	-.035	-.007
18. Neigh$	-.033	.046*	-.034**	-.001	.003	-.015	-.031	.026	.012	-.006
19. Property	.918**	.362**	.385**	.142**	.191**	.066**	.401**	.477**	.154**	.119**
20. Drug use	.649**	.237**	.275**	.056*	.114**	.003	.606**	.552**	.280**	.102**

(Cont.)

	11	12	13	14	15	16	17	18	19
12. Drive	.336**	...							
13. Mosuper	.201**	.187**	...						
14. Fasuper	.168**	.159**	.335**	...					
15. Sex	.153**	.121**	.157**	-.024	...				
16. Race/As	-.103**	-.015	.045*	-.072	.021	...			
17. Race/Ab	.072**	.021	.082**	.073**	.063**	-.116**	...		
18. Neigh$	.009	.039	-.128**	-.262**	-.037	-.019	-.114**	...	
19. Property	.258**	.315**	.335**	.261**	.208**	-.098**	.096**	-.006	...
20. Drug use	.253**	.295**	.268**	.248**	.060**	-.157**	.071**	-.024	.515**

* $p < .05$ ** $p < .01$ (two-tailed)

APPENDIX 2.2
Bivariate correlations
Table 2. Younger teens 11 - 14 (N = 770)
Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9	10
1. Delinq	...									
2. Impuls	.419**	...								
3. Risky	.430**	.029	...							
4. Temper	.222**	.074*	.015	...						
5. Careless	.160**	-.047	-.030	-.059	...					
6. Noplan	.175**	.078*	.006	.031	-.029	...				
7. Smoke	.506**	.221**	.325**	.146**	.071	.111**	...			
8. Drink	.531**	.301**	.271**	.096**	.111**	.073*	.510**	...		
9. Age	.169**	.141**	-.034	.035	.008	.030	.162**	.230**	...	
10. Curfew	.113**	.063	.033	.073*	.068	.013	.012	.055	.078*	...
11. Together	.334**	.249**	.148**	.123**	.072*	.065	.177**	.225**	.138**	.116**
12. Drive	.242**	.186**	.163**	.018	-.031	-.005	.200**	.256**	.230**	-.010
13. Mosuper	.403**	.205**	.240**	.068*	.183**	.021	.161**	.229**	.063	.221**
14. Fasuper	.340**	.229**	.134**	.152**	.120**	.106**	.232**	.244**	.112**	.095**
15. Sex	.100**	.040	.197**	-.024	.021	-.047	-.114**	-.024	.001	.073*
16. Race/As	-.066	-.101**	-.037	.002	-.057	.011	-.127**	-.087*	.007	.112**
17. Race/Ab	.209**	.085*	.145**	.066	.061	.071	.193**	.069	-.022	.019
18. Neigh$	-.108**	-.041	-.142**	-.070	-.056	.015	-.092*	-.055	.054	-.307**
19. Property	.915**	.376**	.415**	.187**	.137**	.157**	.481**	.508**	.178**	.105**

(Cont.)

	11	12	13	14	15	16	17	18
12. Drive	.251**	...						
13. Mosuper	.230**	.148**	...					
14. Fasuper	.168**	.086*	.362**	...				
15. Sex	.180**	.080*	.142**	-.018	...			
16. Race/As	-.086*	-.025	051	-.090**	.037	...		
17. Race/Ab	-.095**	.047	.109**	.077*	.076*	-.132**	...	
18. Neigh$	-.094	-.039	-.147**	-.302**	-.131**	.057	-.096**	...
19. Property	.294**	.266**	.362**	.307**	.086*	.043	.199**	-.085*

* p < .05 ** p < .01 (two-tailed)

APPENDIX 2.3
Bivariate correlations
Table 3. Older teens 15 - 18 (N = 1325)
Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9	10
1. Delinq	...									
2. Impuls	.357**	...								
3. Risky	.407**	-.011	...							
4. Temper	.123**	-.065*	-.018	...						
5. Careless	.230**	.041	.026	.061*	...					
6. Noplan	.056*	-.043	-.005	-.022	.037	...				
7. Smoke	.460**	.182**	.145**	.107**	.080**	.070*	...			
8. Drink	.512**	.282**	.252**	.077**	.127**	.031	.536**	...		
9. Age	-.005	.002	-.026	-.026	-.054	-.035	.123**	.165**	...	
10. Curfew	.104**	.075**	.059*	-.032	.029	-.044	.034	.130**	.206**	...
11. Together	.269**	.244**	.098**	.009	.045	-.019	.254**	.296**	.058*	.086**
12. Drive	.309**	.279**	.116**	.078**	.043	.036	.279**	.351**	.166**	.073**
13. Mosuper	.345**	.115**	.211**	.078**	.126**	.026	.200**	.266**	.098**	.192**
14. Fasuper	.268**	.164**	.108**	.063	.105**	-.002	.192**	.224**	.091**	.205**
15. Sex	.259**	.123**	.230**	-.037	.055*	-.089**	-.014	.108**	.008	.148**
16. Race/As	-.151**	-.093**	-.021	.008	-.050	.023	-.135**	-.222**	.003	-.016
17. Race/Ab	.086**	.007	.029	.023	.020	.029	.117**	.107**	-.004	-.014
18. NeighS	-.010	.084**	-.031	.031	.030	-.028	-.021	.045	-.046	.005
19. Property	.917**	.336**	.377**	.118**	.219**	.032	.352**	.438**	-.027	.098**
20. Violence	.693**	.194**	.352**	.156**	.114**	.064*	.249**	.308**	-.051	.074**
21. Drug use	.667**	.227**	.282**	.032	.145**	.008	.591**	.535**	.112**	.089**

(Cont.)

	11	12	13	14	15	16	17	18	19	20
12. Drive	.365**	...								
13. Mosuper	.175**	.150**	...							
14. Fasuper	.163**	.137**	.305**	...						
15. Sex	.133**	.135**	.174**	-.043	...					
16. Race/As	-.111**	.003	.050	-.049	.013	...				
17. Race/Ab	.063*	.031	.098**	.085**	.057*	-.107**	...			
18. NeighS	.060*	.058*	-.129**	-.252**	.005	-.056*	-.125**	...		
19. Property	.226**	.285**	.295**	.218**	.262**	-.122**	.056*	.0190	...	
20. Violent	.183**	.185**	.275**	.200**	.279**	-.067**	.110**	-.0460	.521**	...
21. Drug use	.282**	.236**	.242**	.248**	.076**	-.185**	.090**	-.0220	.503**	.338**

* $p < .05$ ** $p < .01$ (two-tailed)

APPENDIX 2.4

Bivariate correlations

Table 4. Females (N = 1134)

Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9
1. Delinq	...								
2. Impuls	.377**	...							
3. Risky	.368**	-.081**	...						
4. Temper	.192**	.006	-.045	...					
5. Careless	.273**	.083**	.059*	.061*	...				
6. Noplan	.127**	-.002	.002	-.004	.046	...			
7. Smoke	.516**	.259**	.166**	.126**	.095**	.094**	...		
8. Drink	.526**	.337**	.218**	.080**	.146**	.020	.574**	...	
9. Age	.087**	.125**	-.045	.025	-.032	.012	.229**	.290**	...
10. Curfew	.079**	.048	-.007	-.003	.090**	-.009	.053	.134**	.162**
11. Together	.273**	.299**	.049	.087**	.063*	.053	.271**	.297**	.152**
12. Drive	.255**	.255**	.052	.092**	.016	.011	.307**	.352**	.364**
13. Mosuper	.323**	.148**	.191**	.088**	.158**	.033	.198**	.231**	.141**
14. Fasuper	.281**	.224**	.098**	.093**	.139**	.041	.191**	.272**	.137**
15. Race/As	-.105**	-.075*	.009	.038	-.062*	-.019	-.141**	-.179**	-.034
16. Race/Ab	.142**	.030	.032	.054	.078**	.042	.141**	.113**	-.021
17. Neigh$	-.067*	.026	-.065*	.004	-.011	.004	-.071*	-.006	-.033
18. Property	.912**	.459**	.358**	.174**	.244**	.103**	.419**	.469**	.066*

(Cont.)

	10	11	12	13	14	15	16	17
11. Together	.069*	...						
12. Drive	.047	.352**	...					
13. Mosuper	.174**	.208**	.144**	...				
14. Fasuper	.197**	.171**	.155**	.257**	...			
15. Race/As	-.025	-.067*	-.007	.055*	-.078**	...		
16. Race/Ab	-.013	.072*	.006	.089*	.037	-.099**	...	
17. Neigh$	-.036	.012	.012	-.142**	-.249**	-.025	-.100**	...
18. Property	.073*	.226**	.247**	.276**	.237**	-.084**	.125**	-.025

* $p < .05$ ** $p < .01$ (two-tailed)

APPENDIX 2.5

Bivariate correlations

Table 5. Males (N = 961)

Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9
1. Delinq	...								
2. Impuls	.390**	...							
3. Risky	.395**	.045	...						
4. Temper	.147**	-.017	.042	...					
5. Careless	.134**	-.086**	-.055	-.028	...				
6. Noplan	.088**	.013	.026	-.008	-.015	...			
7. Smoke	.502**	.171**	.233**	.109**	.056	.041	...		
8. Drink	.541**	.278**	.258**	.099**	.083*	.058	.558**	...	
9. Age	.247**	.182**	.028	.023	.005	-.070*	.305**	.402**	...
10. Curfew	.127**	.113**	.056	.027	-.021	-.031	.073*	.139**	.240**
11. Together	.291**	.176**	.129**	.032	.033	-.016	.221**	.261**	.109**
12. Drive	.361**	.294**	.145**	.048	.016	.033	.347**	.432**	.430**
13. Mosuper	.387**	.153**	.188**	.081*	.113**	.033	.264**	.333**	.233**
14. Fasuper	.335**	.174**	.131**	.106**	.075*	.029	.261**	.236**	.191**
15. Race/As	-.157**	-.133**	-.069*	-.030	-.045	.063	-.120**	-.181**	-.007
16. Race/Ab	.084**	.024	.078*	.029	-.007	.059	.113**	.042	-.052
17. Neigh$	.013	.079*	-.050	-.009	.022	-.041	.013	.063	.066*
18. Property	.920**	.362**	.354**	.135**	.138**	.067*	.423**	.478**	.232**
19. Violence	.743**	.257**	.356**	.162**	.048	.115**	.330**	.353**	.082*
20. Drug use	.652**	.195**	.300**	.077*	.087**	-.010	.645**	.557**	.326**

(Cont.)

	10	11	12	13	14	15	16	17	18	19
11. Together	.120**	...								
12. Drive	.115**	.298**	...							
13. Mosuper	.228**	.155**	.218**	...						
14. Fasuper	.164**	.178**	.159**	.420**	...					
15. Race/As	.073*	-.160**	-.028	.028	-.056	...				
16. Race/Ab	-.017	.056	.019	.080*	.113**	-.136**	...			
17. Neigh$	.038	.019	.075*	-.105**	-.276**	-.011	-.124**	...		
18. Property	.117**	.251**	.342**	.342**	.289**	-.124**	.057	.026	...	
19. Violence	.073*	.244**	.234**	.271**	.249**	-.108**	.114**	-.035	.544**	...
20. Drug use	.118**	.244**	.328**	.293**	.269**	-.166**	.039	.014	.529**	.411**

* p < .05 ** p < .01 (two-tailed)

APPENDIX 2.6

Bivariate correlations

Table 6. Younger females 11-14 (N =433)

Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9
1. Delinq	...								
2. Impuls	.404**	...							
3. Risky	.409**	-.056	...						
4. Temper	.249**	.082	-.043	...					
5. Careless	.270**	.037	.037	.046	...				
6. Noplan	.162**	.074	.019	-.025	.009	...			
7. Smoke	.606**	.295**	.383**	.145**	.109*	.119*	...		
8. Drink	.625**	.369**	.335**	.134**	.192**	.013	.630**	...	
9. Age	.182**	.168**	-.028	.079	.010	.059	.180*	.216**	...
10. Curfew	.081	.021	.002	.053	.118*	.044	.046	.064	.058
11. Together	.373**	.320**	.093	.154**	.114*	.103*	.255**	.263**	.188**
12. Drive	.225**	.189**	.130**	.050	-.043	-.046	.161**	.263**	.224**
13. Mosuper	.383**	.215**	.219**	.110**	.238**	.030	.178**	.246**	.048
14. Fasuper	.366**	.235**	.119*	.204**	.199**	.129**	.242**	.320**	.112*
15. Race/As	-.045	-.091	.008	.080	-.052	-.019	-.121*	-.092	-.037
16. Race/Ab	.216**	.081	.107*	.043	.106**	.051	.221**	.140**	.051
17. NeighS	-.143**	-.059	-.132**	-.071	-.075	-.001	-.101*	-.122*	.033
18. Property	.909**	.382**	.413**	.198**	.228**	.125**	.574**	.606**	.178**

(Cont.)

	10	11	12	13	14	15	16	17
11. Together	.075	...						
12. Drive	-.027	.290**	...					
13. Mosuper	.188**	.294**	.156*	...				
14. Fasuper	.144**	.194**	.097	.355**	...			
15. Race/As	.080	-.079	.029	.078	-.085	...		
16. Race/Ab	.026	.102*	.007	.075	.014	-.110*	...	
17. NeighS	-.080	-.068	-.003	-.088	-.308**	.067	-.021	...
18. Property	.086	.329**	.273**	.344**	.324**	-.023	.207**	-.070

* $p < .05$ ** $p < .01$ (two-tailed)

APPENDIX 2.7

Bivariate correlations

Table 7. Older females 15 - 18 (N = 701)

Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9
1. Delinq	...								
2. Impuls	.354**	...							
3. Risky	.351**	-.095*	...						
4. Temper	.157**	-.050	-.046	...					
5. Careless	.279**	.116**	.071	.070	...				
6. Noplan	.110**	-.048	-.007	.008	.067	...			
7. Smoke	.476**	.226**	.091*	.114**	.097*	.089*	...		
8. Drink	.478**	.302**	.184**	.044	.138**	.026	.526**	...	
9. Age	-.075*	-.006	-.081*	-.066	-.071	.015	.081*	.105**	...
10. Curfew	.066	.048	-.009	-.037	.078*	-.034	.030	.133**	.203**
11. Together	.200**	.266**	.026	.034	.031	.022	.259**	.289**	.019
12. Drive	.245**	.259**	.035	.102**	.050	.038	.286**	.299**	.101**
13. Mosuper	.291**	.102**	.188**	.075*	.131**	.036	.174**	.191**	.039
14. Fasuper	.225**	.204**	.089**	.022	.106**	-.009	.149**	.226**	.086*
15. Race/As	-.138**	-.062	.009	.013	-.068	-.019	-.153**	-.227**	-.040
16. Race/Ab	.104**	-.001	-.016	.064	.058	.036	.121**	.119**	-.026
17. Neigh$	-.031	.074*	-.036	.043	.019	.006	-.056	.048	-.041
18. Property	.913**	.323**	.335**	.158**	.256**	.092*	.357**	.409**	-.086*

(Cont.)

	10	11	12	13	14	15	16	17
11. Together	.049	...						
12. Drive	.030	.362**	...					
13. Mosuper	.156**	.153**	.087*	...				
14. Fasuper	.212**	.153**	.097**	.205**	...			
15. Race/As	-.079*	-.057	-.014	.050	-.072*	...		
16. Race/Ab	-.031	.057	.022	.105	.056	-.092*	...	
17. Neigh$	-.014	.061	.033	-.158**	-.221**	-.072	-.146**	...
18. Property	.058	.157**	.223**	.243**	.183**	-.117**	.081**	-.003

* $p < .05$ ** $p < .01$ (two-tailed)

APPENDIX 2.8
Bivariate correlations
Table 8. Younger males 11-14 (N = 337)

Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9
1. Delinq	...								
2. Impuls	.437**	...							
3. Risky	.433**	.105	...						
4. Temper	.201**	.068	.081	...					
5. Careless	.034	-.163**	-.109*	-.186**	...				
6. Noplan	.201**	.088	.012	.091	-.072	...			
7. Smoke	.425**	.112**	.345**	.143**	.018	.092	...		
8. Drink	.440**	.214**	.232**	.049	.011	.140*	.334**	...	
9. Age	.156**	.105	-.043	-.020	.005	-.005	.138*	.248**	...
10. Curfew	.133*	.110*	.034	.100	.007	-.014	-.017	.049	.101**
11. Together	.263**	.134*	.148**	.096	.005	.038	.108*	.193**	.073
12. Drive	.245**	.181**	.167**	-.008	-.022	.041	.287**	.258**	.242**
13. Mosuper	.409**	.191**	.218**	.037	.125	.028	.195**	.229**	.081
14. Fasuper	.318**	.223**	.163**	.087	.020	.076	.219**	.146*	.112
15. Race/As	-.096	-.119*	-.096	-.085	-.065	.049	-.130*	-.079	.061
16. Race/Ab	.191**	.084	.154**	.093	.014	.097	.194**	.004	-.098
17. Neigh$	-.045	-.005	-.109*	-.077	-.028	.021	-.123*	.016	.082
18. Property	.921**	.371**	.403**	.182**	.037	.200**	.411**	.416**	.182**
19. Drug use	.513**	.151**	.317**	.095	-.026	.047	.514**	.339**	.168**

(Cont.)

	10	11	12	13	14	15	16	17	18
11. Together	.146**	...							
12. Drive	-.006	.195**	...						
13. Mosuper	.239**	.119*	.124*	...					
14. Fasuper	.041	.146**	.079	.387**	...				
15. Race/As	.143**	-.116*	-.082	.016	-.095*	...			
16. Race/Ab	.002	.065	.068	.119*	.145**	-.161**	...		
17. Neigh$	.022	-.078	.055	-.177**	-.306**	.057	-.152**	...	
18. Property	.114*	.236**	.251**	.397**	.307**	-.070	.183**	-.080	...
19. Drug use	-.018	.112*	.269**	.210**	.154**	-.089	.024	-.003	.475**

* $p < .05$ ** $p < .01$ (two-tailed)

APPENDIX 2.9

Bivariate correlations

Table 9. Older males 15-18 (N = 624)

Self-control variables and predictors, exogenous variables, and delinquency

	1	2	3	4	5	6	7	8	9
1. Delinq	...								
2. Impuls	.329**	...							
3. Risky	.384**	.007	...						
4. Temper	.121**	-.073	.021	...					
5. Careless	.176**	-.054	-.032	.055	...				
6. Noplan	.057	-.015	.036	-.062	.016	...			
7. Smoke	.489**	.139**	.208**	.100*	.064	.047	...		
8. Drink	.525**	.243**	.275**	.117**	.107**	.055	.556**	...	
9. Age	.056	.008	.015	.018	-.037	-.088*	.171**	.226**	...
10. Curfew	.071	.069	.057	-.013	-.040	-.028	.042	.100*	.213**
11. Together	.298**	.186**	.116**	-.011	.047	-.044	.258**	.287**	.106**
12. Drive	.322**	.275**	.132**	.066	.022	.059	.280**	.380**	.233**
13. Mosuper	.339**	.091*	.172**	.098*	.105**	.048	.237**	.310**	.162**
14. Fasuper	.306**	.108*	.111**	.112**	.099**	.015	.241**	.216**	.095*
15. Race/As	-.181**	-.133**	-.053	.004	-.032	.070	-.115**	-.224**	.048
16. Race/Ab	.051	.002	.038	-.010	-.018	.033	.116**	.088*	.014
17. Neigh$	.006	.096*	-.031	.019	.041	-.064	.017	.043	-.051
18. Property	.911**	.319**	.338**	.113**	.179**	.028	.384**	.443**	.017
19. Violence	.726**	.178**	.351**	.164**	.062	.105**	.323**	.342**	-.001
20. Drug use	.668**	.157**	.303**	.070	.118**	-.009	.633**	.549**	.176**

(Cont.)

	10	11	12	13	14	15	16	17	18	19
11. Together	.091*	...								
12. Drive	.080*	.346**	...							
13. Mosuper	.187**	.160**	.176**	...						
14. Fasuper	.188**	.185**	.121**	.410**	...					
15. Race/As	.049	-.185**	.017	.047	-.024	...				
16. Race/Ab	-.016	.056	.025	.077*	.107**	-.122**	...			
17. Neigh$	.024	.058	.084*	-.104*	-.289**	-.038	-.108**	...		
18. Property	.066	.249**	.294**	.282**	.243**	-.142**	.015	.037	...	
19. Violence	.030	.241**	.214**	.250**	.253**	-.114**	.093*	-.061	.532**	...
20. Drug use	.100**	.290**	.251**	.269**	.269**	-.193**	.069*	-.012	.509**	.430**

* $p < .05$ ** $p < .01$ (two-tailed)